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ANATOMY FORM & FUNCTION

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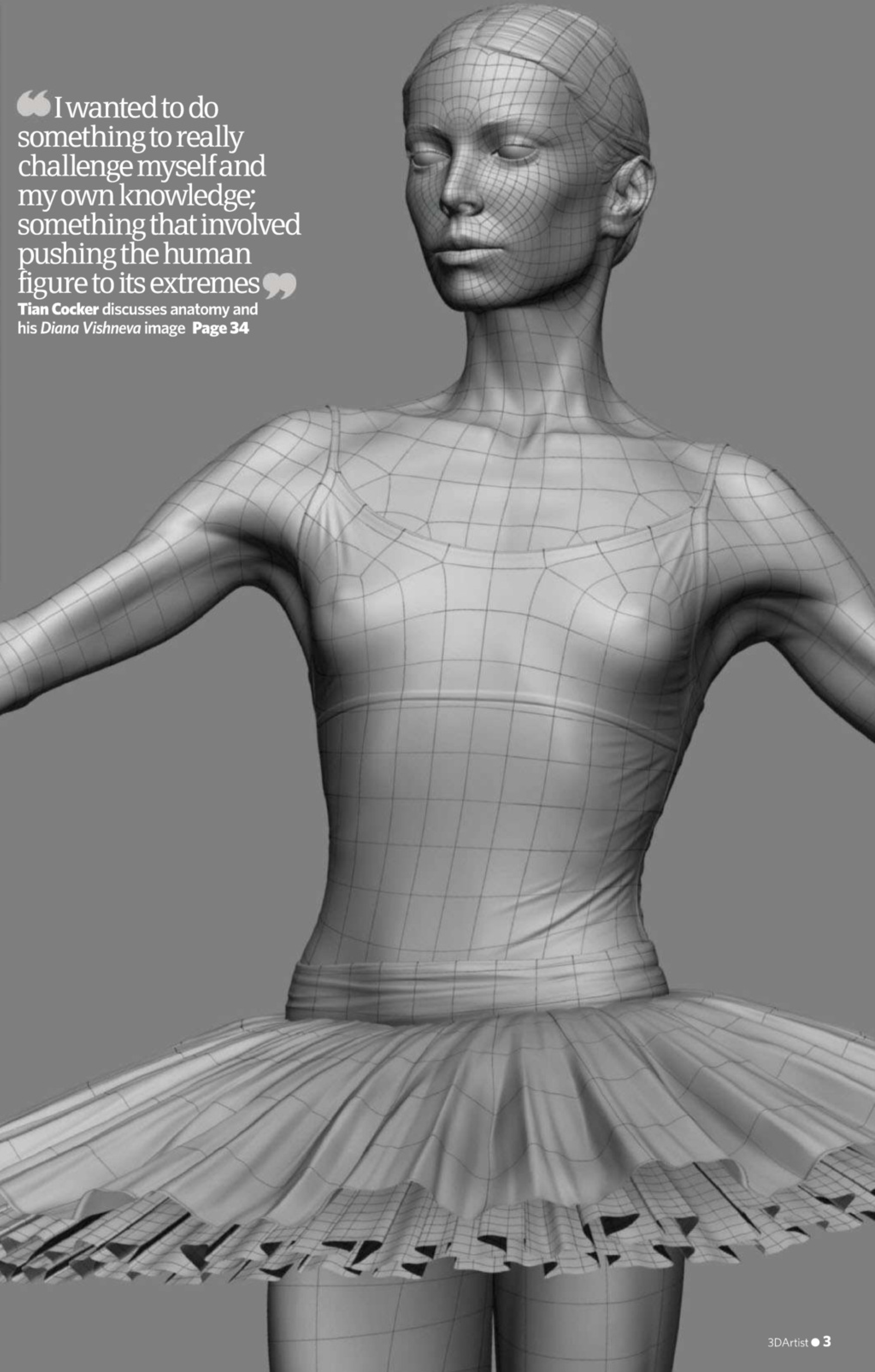
Tian Cocker

Personal portfolio site www.tiancocker.com

Country UK

Software ZBrush

We often hear from our readers how difficult anatomy can be. To make matters easier, we met with experts Scott Eaton, Tian Cocker, Ryan Kingslien and Dan Crossland to get some advice on how you can improve your own skills. Turn to p34 for our grand anatomy masterclass.



> “I wanted to do something to really challenge myself and my own knowledge; something that involved pushing the human figure to its extremes”

Tian Cocker discusses anatomy and his *Diana Vishneva* image **Page 34**

Speed up your workflow. Page 24

Welcome

to the magazine and 116 pages of amazing 3D

Hello and welcome to 3D Artist magazine! The complexity of human musculature makes anatomy a daunting subject for anyone involved in digital sculpting. Thankfully, we've spoken with some of the world's top artists to find out just how they approach the re-creation of skin and tissue to achieve fully believable results. We also take a closer look at DreamWorks Animation's exciting new toolset, Apollo, and offer 50 tips and tricks to help speed up your workflow. Enjoy!

Chris Editor

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3. **A CD packed full of creative goodness**
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5. **Tips for studying 3D or getting work in the industry**
6. The chance to see your art in the mag!

This issue's team of expert artists…

Hasan Bajramovic

Hasan turns his well-honed ZBrush skills to a fighter pilot this issue. Turn to p48 for the results

Mouhsine Adnani

Want to create a *Mass Effect*-style interior environment? Mouhsine reveals his workflow on p56

Stefano Tsai

3ds Max expert Stefano discusses how he creates his fantasy-themed warships on p64

Gustavo Åhlén

Continuing his expert anatomy series, this issue Gustavo takes a look at how to sculpt the male torso, p74

Vikrant Dalal

If simulation is your thing then look no further than this in-depth FumeFX tutorial p78

Lino Grandi

If you want to try mo-cap at home, turn to p88 where Lino reveals how to set up NevronMotion

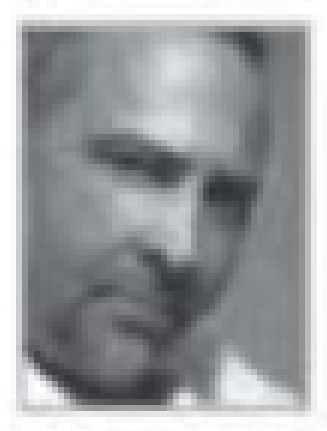
Adam Ball

The creation of low-poly characters for videogames is a delicate task. Follow Adam's advice on p90

Ângelo Fernandes

Splines can be incredibly useful for a variety of purposes, as Ângelo ably proves over on p92

Dave Scotland



This issue Dave takes a look at 3ds Max 2015. Does this version stand up to past releases? Find out on p96

Tian Cocker

Tian and other 3D experts describe their varying approaches to CG anatomy in our feature, starting on p34

Andrew Price

The Blender Guru himself, Andrew Price, gets involved in our speed tips and tricks feature on p24

Jahirul Amin

Jahirul's contributed to our speed feature too, revealing techniques that can help you use Maya more efficiently

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With over two million eyeballs on his YouTube "Eye Piece" animation (and Best of YouTube Channel selection to his credit), Chris Jones is shaking up the world of 3D CG with ultra-realistic human anatomy images that are straight up incredible. At the heart of this talented artist's pipeline is LightWave 3D.

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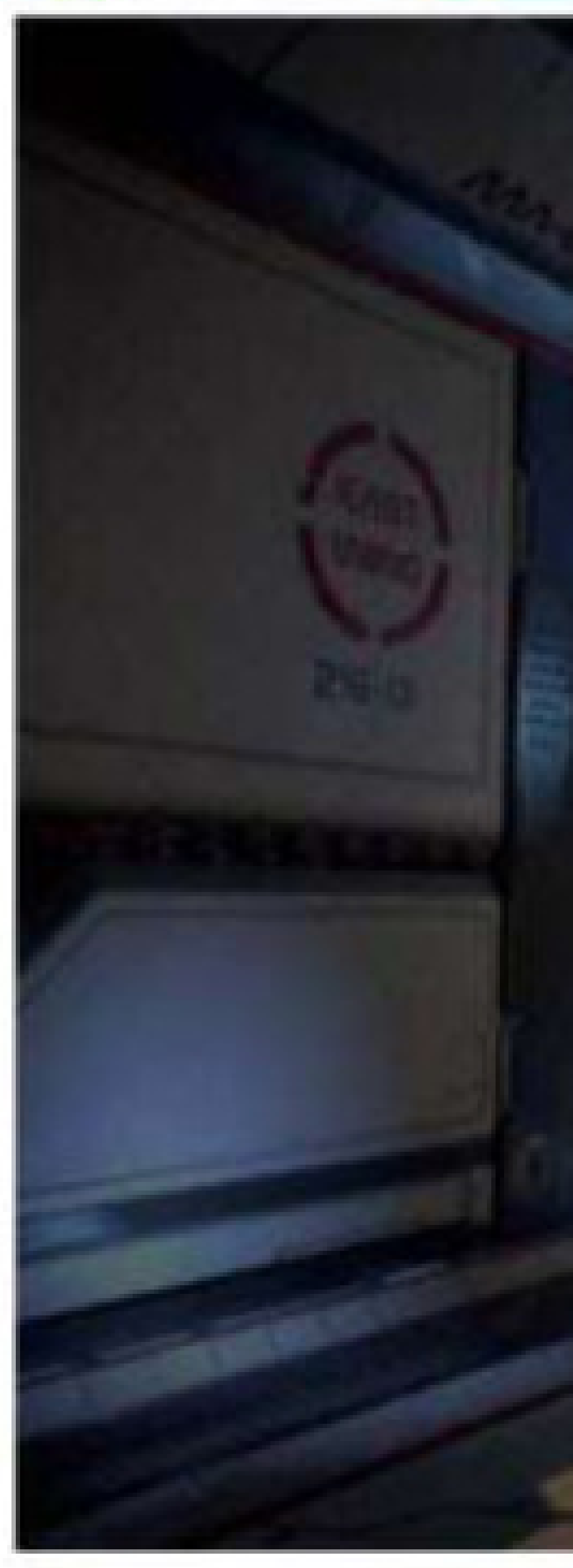
Anatomy: form and function

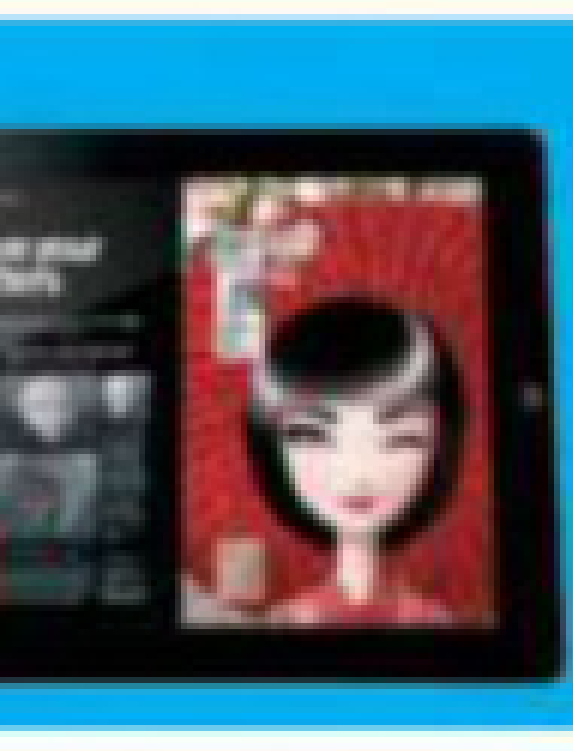
"The more you know, the faster you work and the more consistent your results are"

Ryan Kingslien discusses the principles of anatomy sculpting **Page 34**



Model complex characters

Build 3ds Max fantasy vehicles



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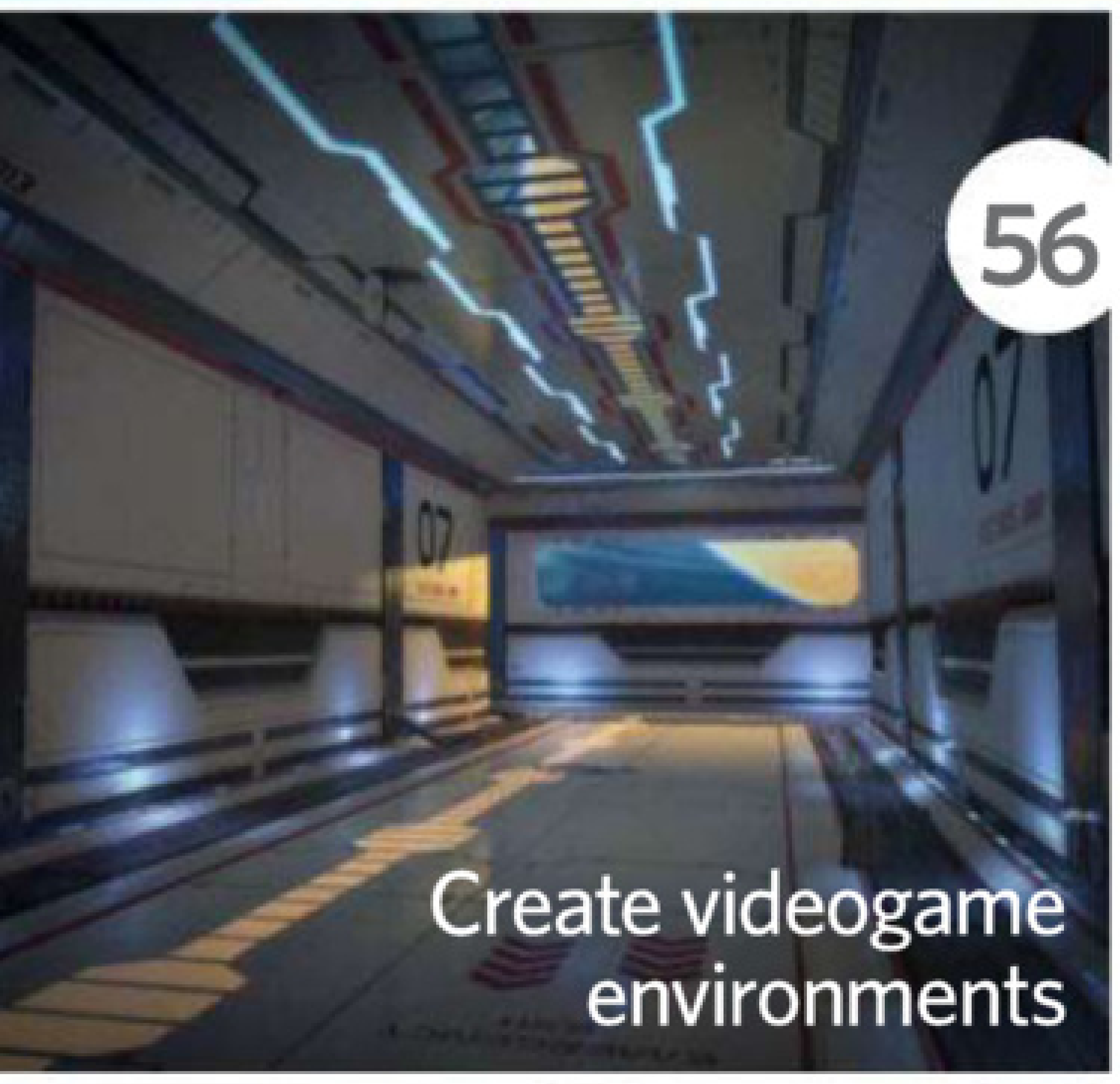

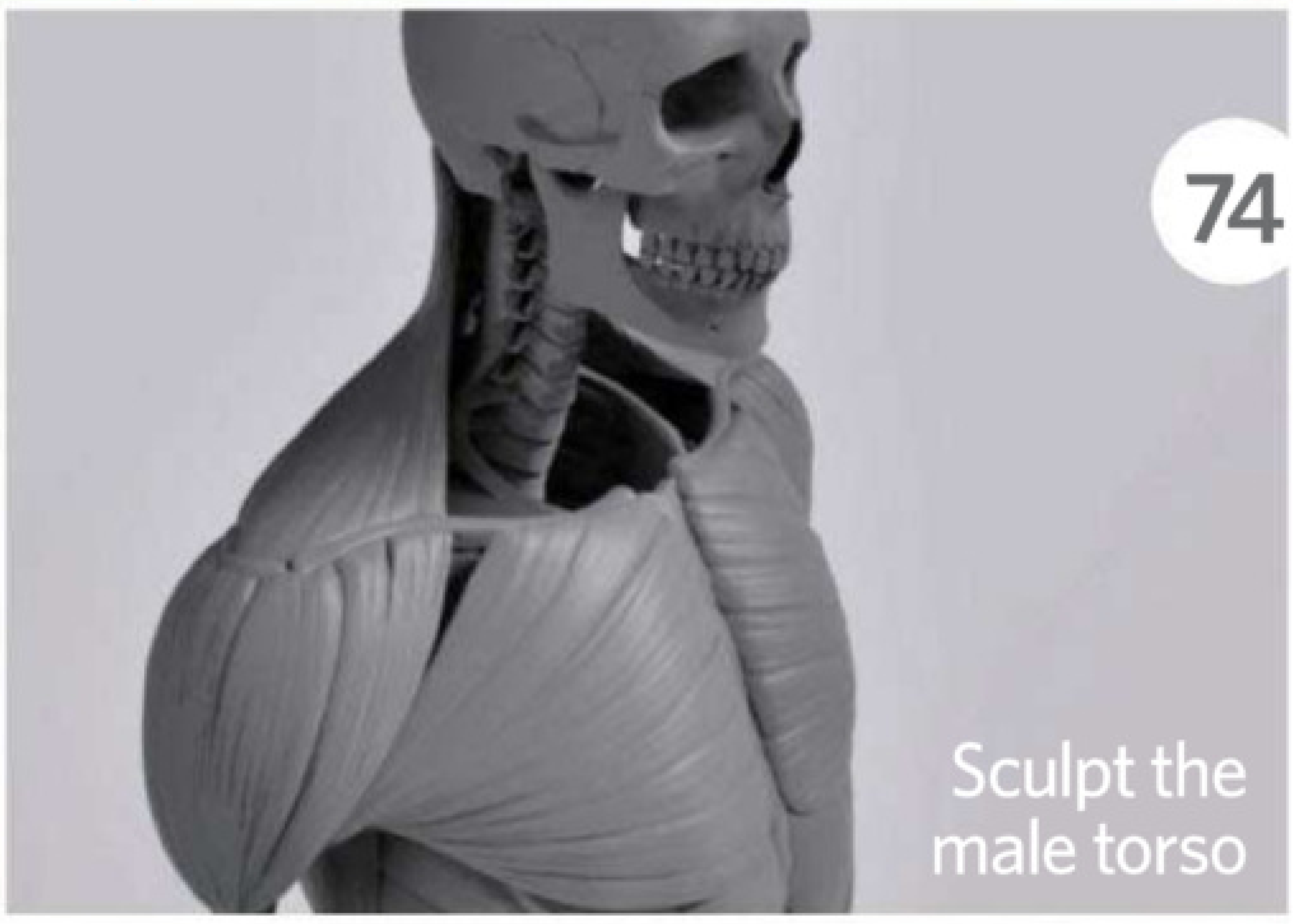

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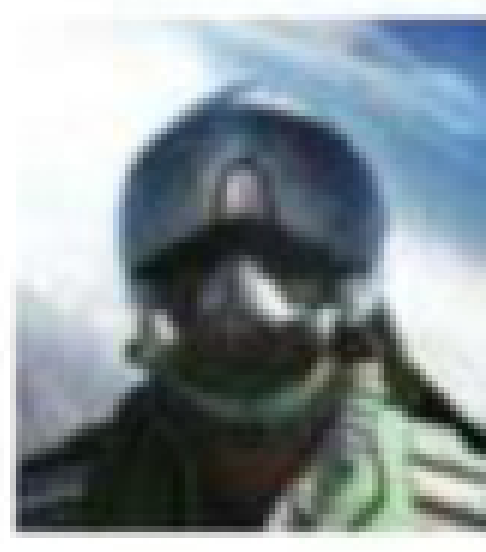
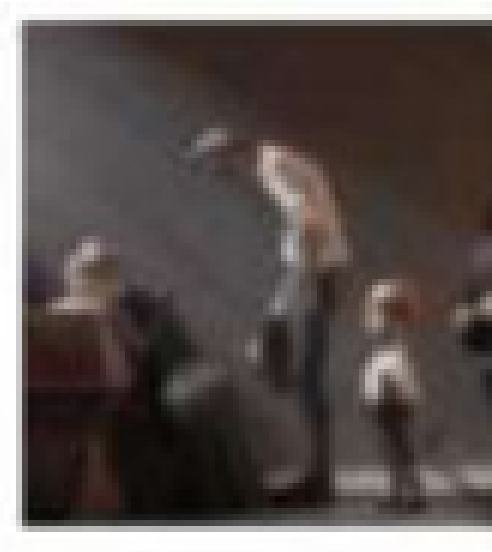
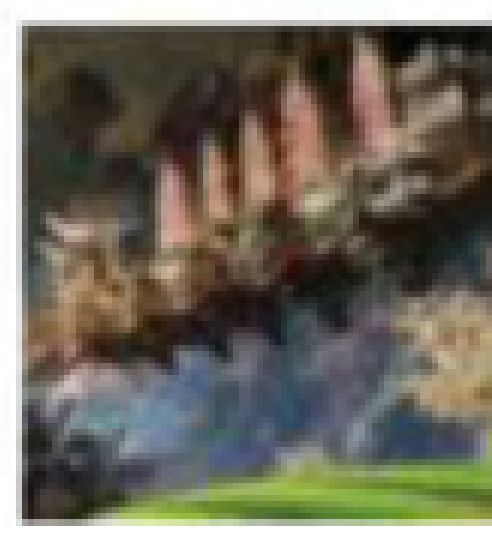
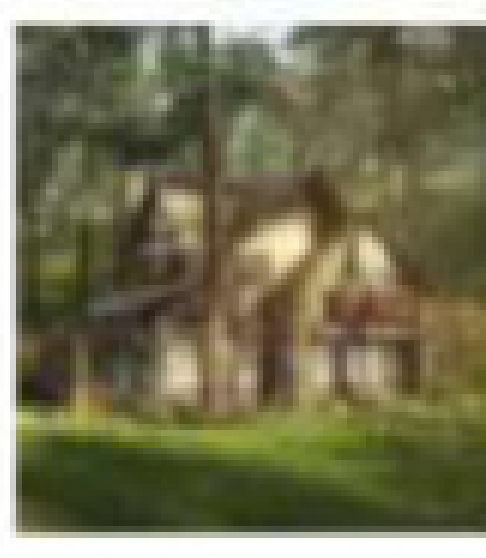
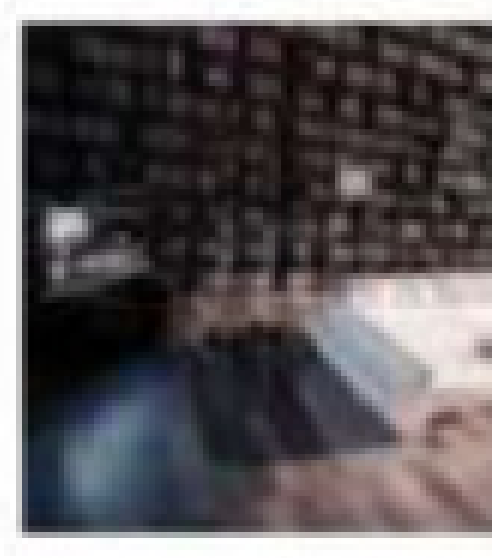
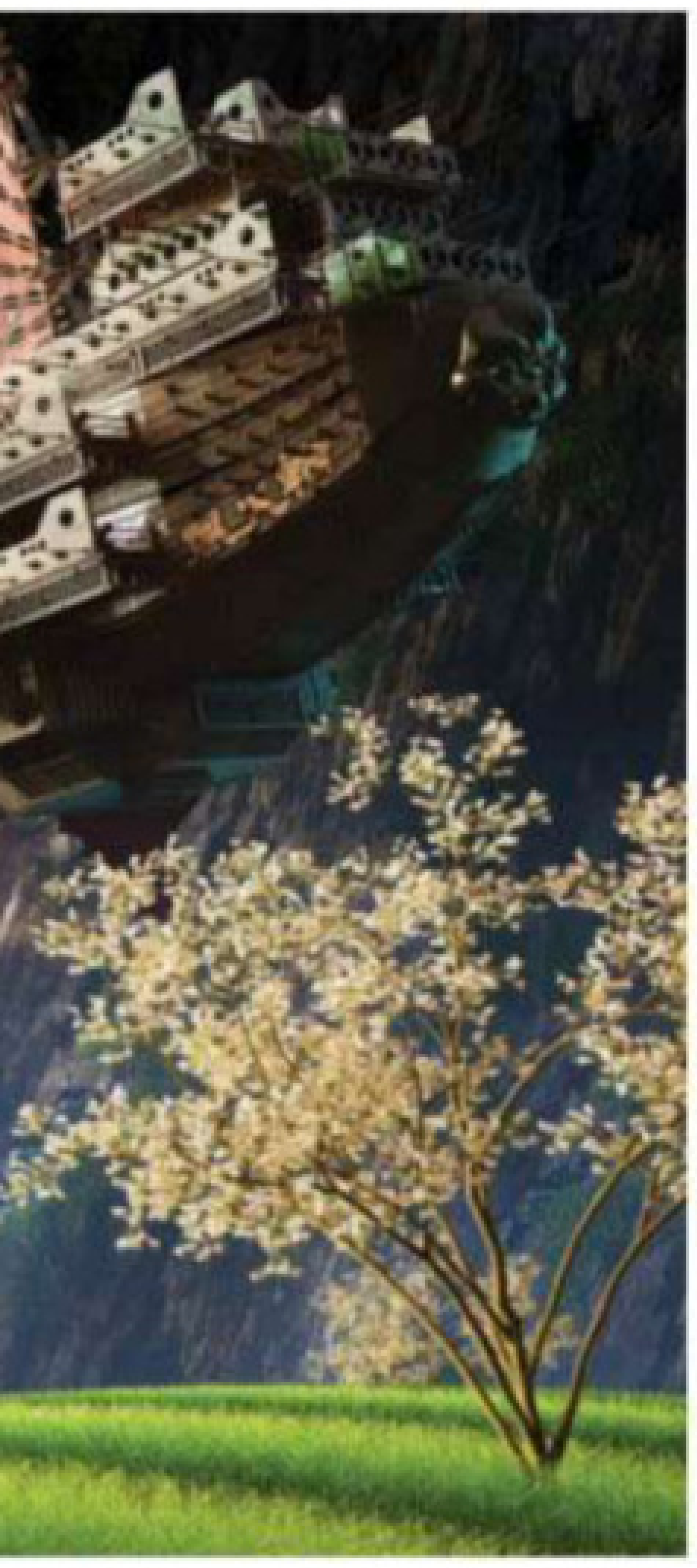


> “Apollo has changed our entire approach to the production process. What was once linear and limited is now collaborative and scalable”

Lincoln Warren, DreamWorks CTO, talks Apollo **Page 42**



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Turn to page 112 for the complete list of the disc's contents

Daniel Kho

Daniel is an artist aspiring to work in animation. His enjoys translating 2D sketches into 3D

Personal portfolio site www.danielkho.com

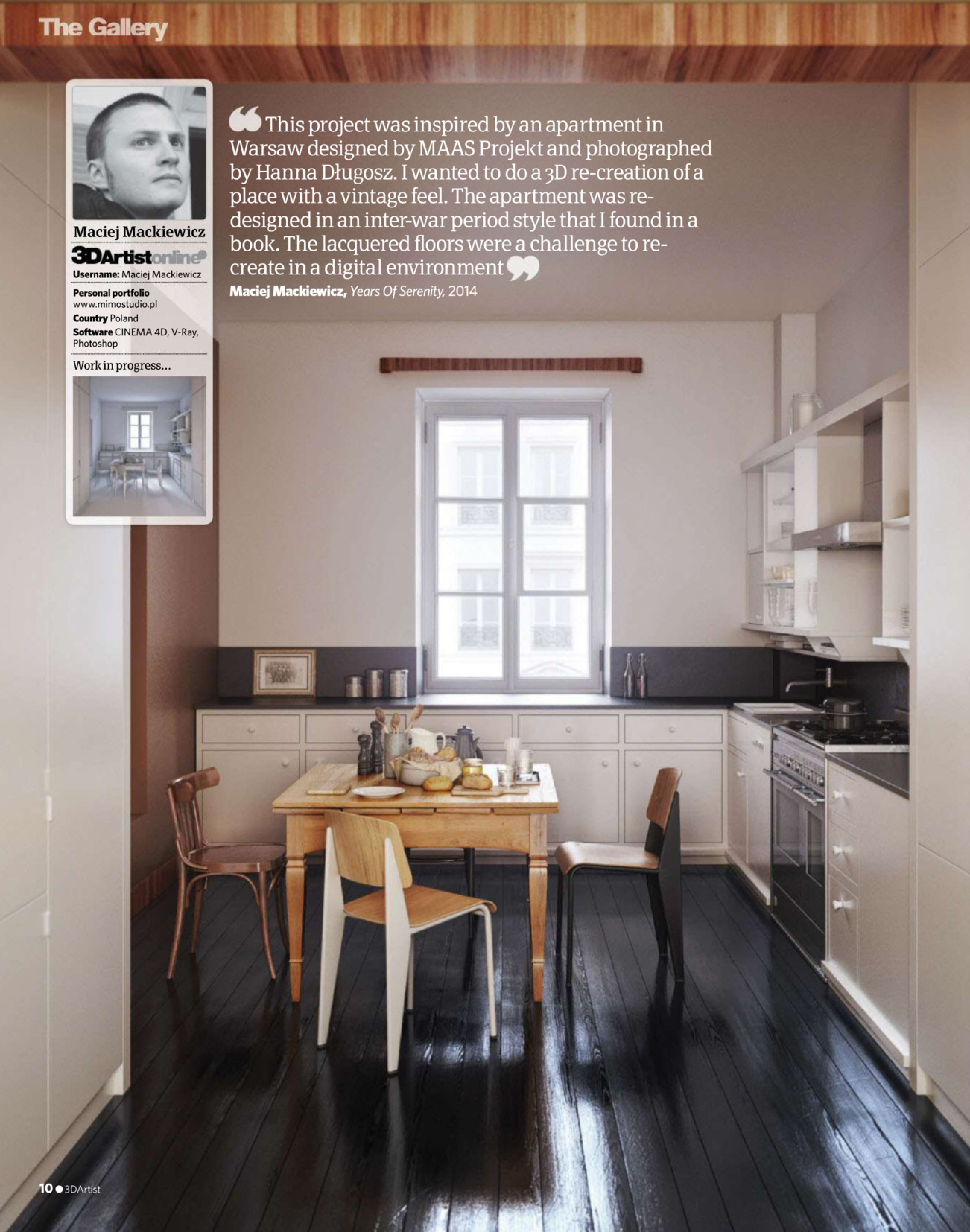
Country USA

Software used Maya, ZBrush, Mudbox, Photoshop

Work in progress…

> This is based on a 2D piece created by Renan Nuche that really inspired me. It was such a dynamic pose that I thought it would be interesting to re-create it in 3D. It was a really fun and rewarding process

Daniel Kho, *Thanatos,* 2014



Maciej Mackiewicz

3DArtistonline

Username: Maciej Mackiewicz

Personal portfolio
www.mimostudio.pl
Country Poland
Software CINEMA 4D, V-Ray, Photoshop

Work in progress…

> This project was inspired by an apartment in Warsaw designed by MAAS Projekt and photographed by Hanna Długosz. I wanted to do a 3D re-creation of a place with a vintage feel. The apartment was re-designed in an inter-war period style that I found in a book. The lacquered floors were a challenge to re-create in a digital environment

Maciej Mackiewicz, *Years Of Serenity*, 2014

> “The idea here was to create a very detailed female character in ZBrush and to study the female anatomy, then later make a game-res version of her”

Javier Zuccarino, *Enchantress based on a concept from the game* Diablo 3, 2013

Javier Zuccarino

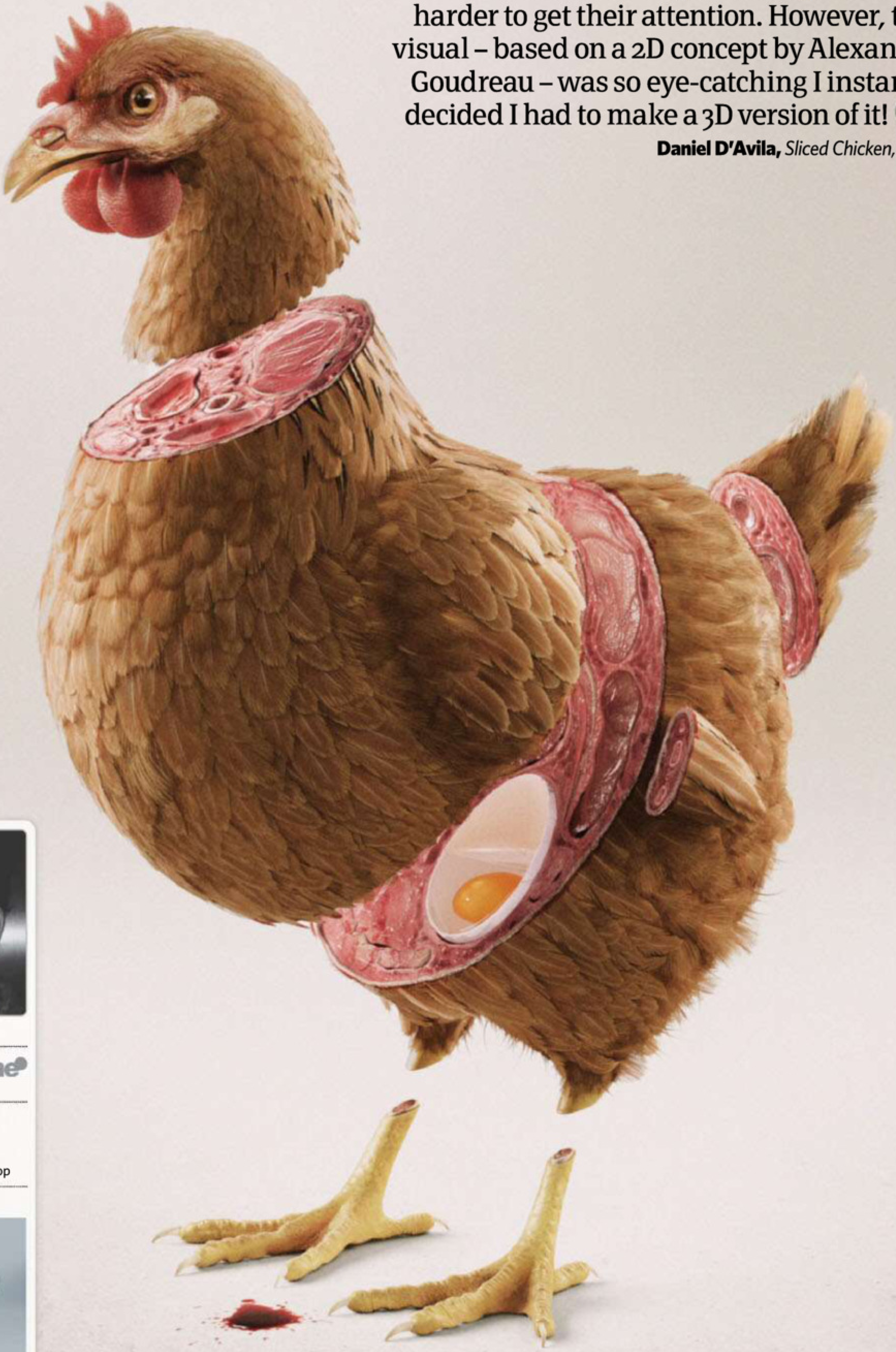
Javier currently works in advertising at a local Argentine studio, Gizmo, as a 3D artist

Personal portfolio www.zuka.dunked.com

Country Argentina

Software ZBrush

Work in progress...



> People have never been so visually stimulated as they are today. It's much harder to get their attention. However, this visual – based on a 2D concept by Alexandre Goudreau – was so eye-catching I instantly decided I had to make a 3D version of it!

Daniel D'Avila, *Sliced Chicken,* 2014

Daniel D'Avila

3DArtistonline

Username: dddavila

Personal portfolio
www.davilastudio.com
Country Brazil
Software MODO, Photoshop

Work in progress…

Jonas Skoog

3DArtistonline

Username: energise

Personal portfolio www.jonasskoog.com

Country Brazil

Software ZBrush, MARI, Marvelous Designer, Yeti, Arnold, Photoshop

Work in progress…

> “This guy was part of the release trailer for a roleplaying game called *Mutant: Year Zero* that some friends and I created in our spare time. He’s a mutated hybrid between a human and a fly”

Jonas Skoog, *Mutant: Year Zero,* 2014

> “This project catches a special moment in city life, when you can see and feel all of the cityscape elements, such as construction, towers, buildings, roads, trucks, people, ships and so on”

Karim Moussa Elramly,
Cityscape Icons, 2014

Karim Moussa Elramly

3DArtist online

Username: bazooka

Personal portfolio
N/A

Country Egypt/Norway

Software AutoCAD, 3ds Max, V-Ray, Ghost Town, Photoshop

Work in progress…

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MAIN The jam took place between 5 and 6 July at Mind Candy's East London offices, which provided both private rooms for teams, as well as the latest hardware and technology to help

BOTTOM Studios even sometimes use Game Jam events as a way to prototype different concepts in a highly creative environment, and let those form the basis of their next release

The Great British Summer Game Jam

Autodesk's Kevin Booth tells us how teams of artists created fully playable games in the space of two short days

Whether you had never touched 3D software before, or were a seasoned game developer with years of experience under your belt, didn't really matter at this year's Great British Summer Game Jam. The ultimate goal remained the same: to try to win an estimated 10 to 15,000 dollars' worth of prizes by creating a playable game over the course of only a weekend.

"The idea was to just get involved and see what you could do in about 20 hours," begins Kevin Booth, sales development manager at Autodesk, who partnered with Marmalade, Unity 3D and Simplygon among others to provide technology for the jam. The event, which was hosted at Mind Candy's London offices, was open to anyone, with the only rules being that no assets could be created before the event.

"Mind Candy actually entered their own team, and they're obviously a professional development studio anyway, but they just wanted to test out their skills together," explains Booth. "We also had some people from triple-A studios that were just friends, and then I had people phone me up and say look, I can't use any 3D products and have no games experience, but I'm very keen, so even those guys would turn up on the morning and we found them a team to join. They just got involved in trying to sketch out what the game should be and how it should play, using it as a way of getting some experience developing a game, and I think everyone valued their input as well because they weren't bogged down with the technical nature of developing it, they were just coming at it from a fresh perspective."

For Autodesk, of course, it was also a great way to showcase Maya LT – a lighter version of Maya released last year and created specifically for indie and mobile game developers. A week before the event began, they and the other

What's up for grabs

"We put together a prize fund, which was supported by all the technology partners who got involved with the event," says Booth. "We had software licenses for all of the products that were supporting it, so that meant Marmalade licenses, a 12-month access licence to Simplygon's online cloud toolset, PlayCanvas licenses, Allegorithmic Painter licenses and Substance Designer licenses, as well as a top-of-the-range AMD graphics card, a Games Stick console and a range of books. It was everything you'd need to either build a game from scratch or carry on and polish the game built at the Game Jam. That was the intention; that whoever won would get all the licenses they'd need to carry on working on the project with what they had learned."

The idea was to just get involved and see what you could do in about 20 hours

Kevin Booth, Sales development manager at Autodesk

technology partners organised an evening kick-off session, which included presentations on the workflows for developing a game with their products. The participants would then have free access to the software throughout Game Jam, as well as support if they had any problems with it – though of course, there were no restrictions on using any other type of software, if preferred.

"I turned up from the get go on Saturday morning, and most people were already in a team and had 3D artists with them; some people were new to Maya LT, some people were Maya users and wanted to try Maya LT," says Booth. "Basically, as soon as the Game Jam started, people went into a room or they went into their own separate rooms if they wanted to work in a closed environment, and started sketching on whiteboards. Literally within a couple of hours you had people building 3D models, it was really impressive!"

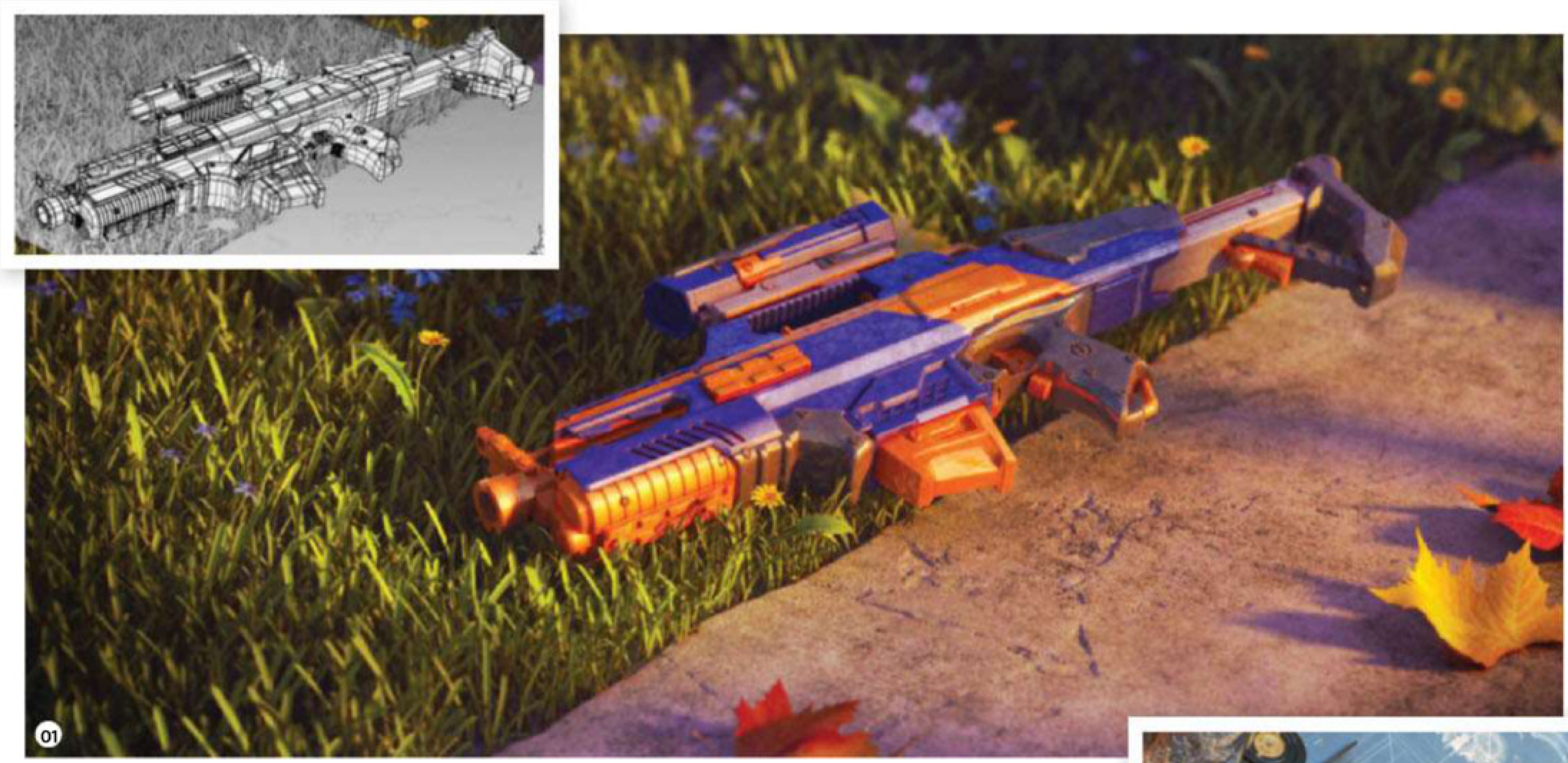
Ultimately, over 60 people joined in to create games at the event, in teams ranging from six artists to one. Several team members even acted as remote users, creating assets and helping with work farmed out to them while using Skype to communicate. Finally, at the end of the two days of the event, the 12 teams submitted their final games for judging by a panel.

The first-place winner of the event was a solo developer, Gianluca Sclano, with a game named *Tapping on the Beach* – an entry that also won the Summer Game Jam's accessibility award for being customisable in everything from input devices to colour choices for anyone with disabilities. "Because it was so polished and so customisable, I think the judging panel decided that was the best fit," explains Booth. "Meanwhile, the team that came second used Maya LT and created a very ambitious 3D project named *Sunshi*e*, so we had some different types of games there. People were saying it was the best Game Jam they'd attended. I think it felt quite professional because we held it at the Mind Candy offices and we'd fully catered it so that people didn't have to go out and get food, so all in all people were very comfortable and they had a lot of support throughout the event."

For both Booth, who had never attended a Game Jam before, and Autodesk itself, which had never ventured into being involved in one in Europe, it marks a change in the way the company approaches indie developers. "We didn't really know what to expect, and a little bit of my role is to work out how best to communicate the value of Maya LT to an indie audience; an audience that we haven't really interacted with historically," says Booth. "Autodesk have usually dealt with only the triple-A game studios and the big established players, and this is a way to really support another part of the community. I would love to do more of these in the future."

TOP, BOTTOM To view videos introducing the different games that were produced during the event and more, head over to **www.youtube.com/user/MindCandyVideos/playlists**

LEFT The Great British Summer Game Jam was hosted by Mind Candy, the studio behind the title *Moshi Monsters*, which first launched in 2004



Rendering weapons

The winners of the Humster3D Weapon Competition tell us how they created their winning weapon renders

First Place Tyler Gibbons
Title of Work Evening Forgetfulness
Website www.humster3d.com/2014/05/19/evening-forgetfulness
Tools used 3ds Max, Photoshop

Entering a competition against so much talent was both inspiring and intimidating, so I decided to stick to the basics and get creative. I used 3ds Max, and a custom hotkey set for Swift Loop really sped up the modelling process, along with the other graphite modelling tools. Modelling was mainly a matter of identifying the individual sections of the real toy gun and using basic subdivision modelling to build them piece by piece. Unwrapping UVs seemed like a roadblock, but I discovered how quick unwrapping can be using seams and the Peel tools in Max's UVW editor.

I was excited to attempt a translucent plastic material, since I had just learned how to create reflective subsurface scattering. This actually informed the direction for the final image, as I wanted a low, bright light to shine through the plastic to show off the material, which lent itself to an evening outdoor lighting scene. I scattered the grass with Advanced Painter, a free script from ScriptSpot, and I added lens effects, atmosphere, and colour correction in Photoshop.

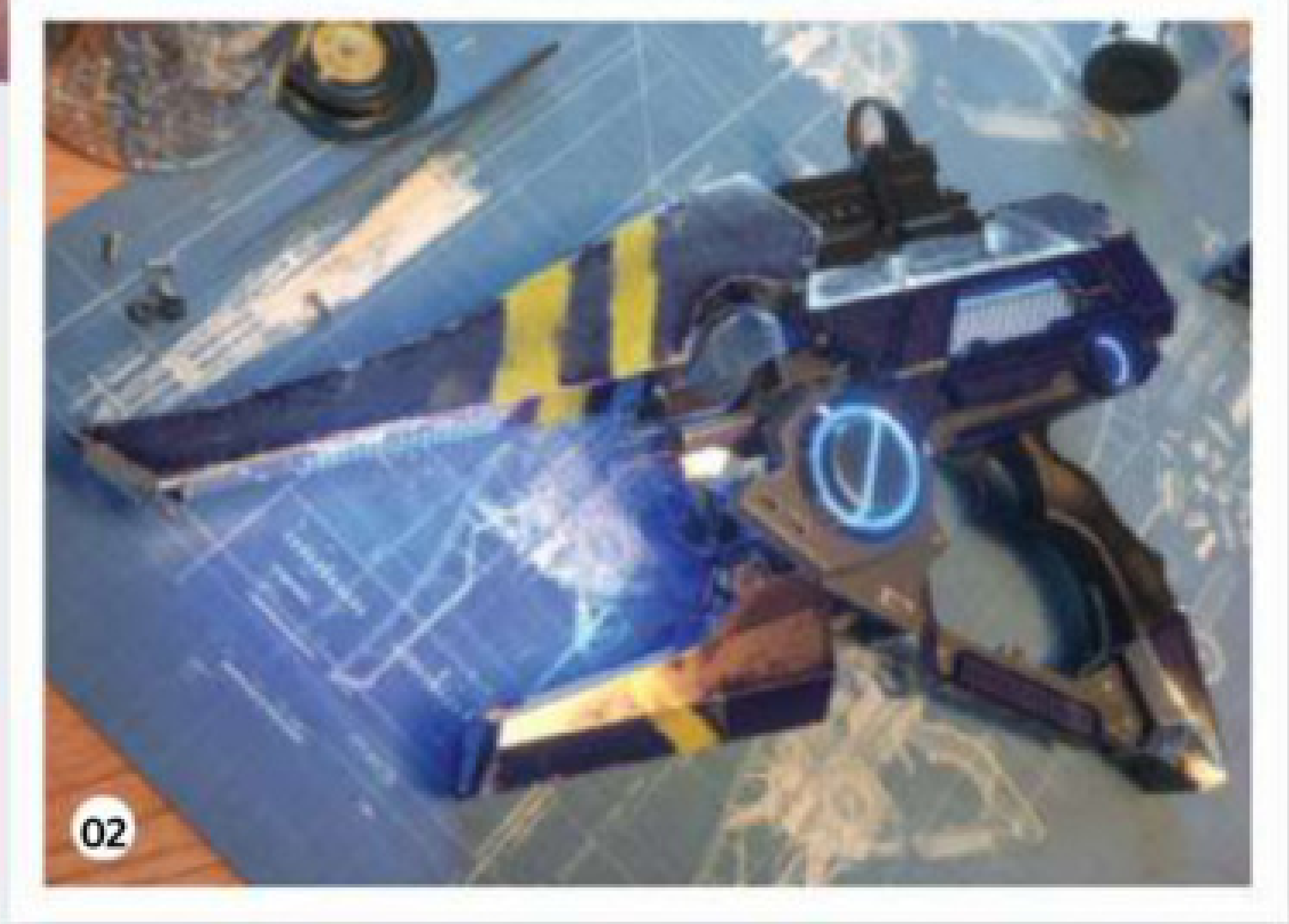
Second Place Sanjaya Senarath Karalliyadda
Title of Work THE WAR
Website www.humster3d.com/2014/05/19/the-war
Tools used 3ds Max, V-Ray, Mudbox, Photoshop, After Effects

I always believe there are so many things we can infer we are looking closely at an image. My idea was to simply create an image that showed the targets standing up against the weapon that was going to be shooting them. I used 3ds Max 2011, V-Ray, Photoshop, and After Effects to finish the project, which was created in a couple of weeks.

Third Place Liu Zinan
Title of Work Energy Pistol
Website www.humster3d.com/2014/05/26/energy-pistol
Tools used Maya, Substance Designer, Octane Render, Photoshop

I used Maya for the modelling of the Energy Pistol, and then assigned different colours to different gun parts, each colour representing a different material. Then, I made a node graph in Substance Designer that created appropriate Diffuse, Roughness, Metallic and Normal maps according to the previously assigned colours.

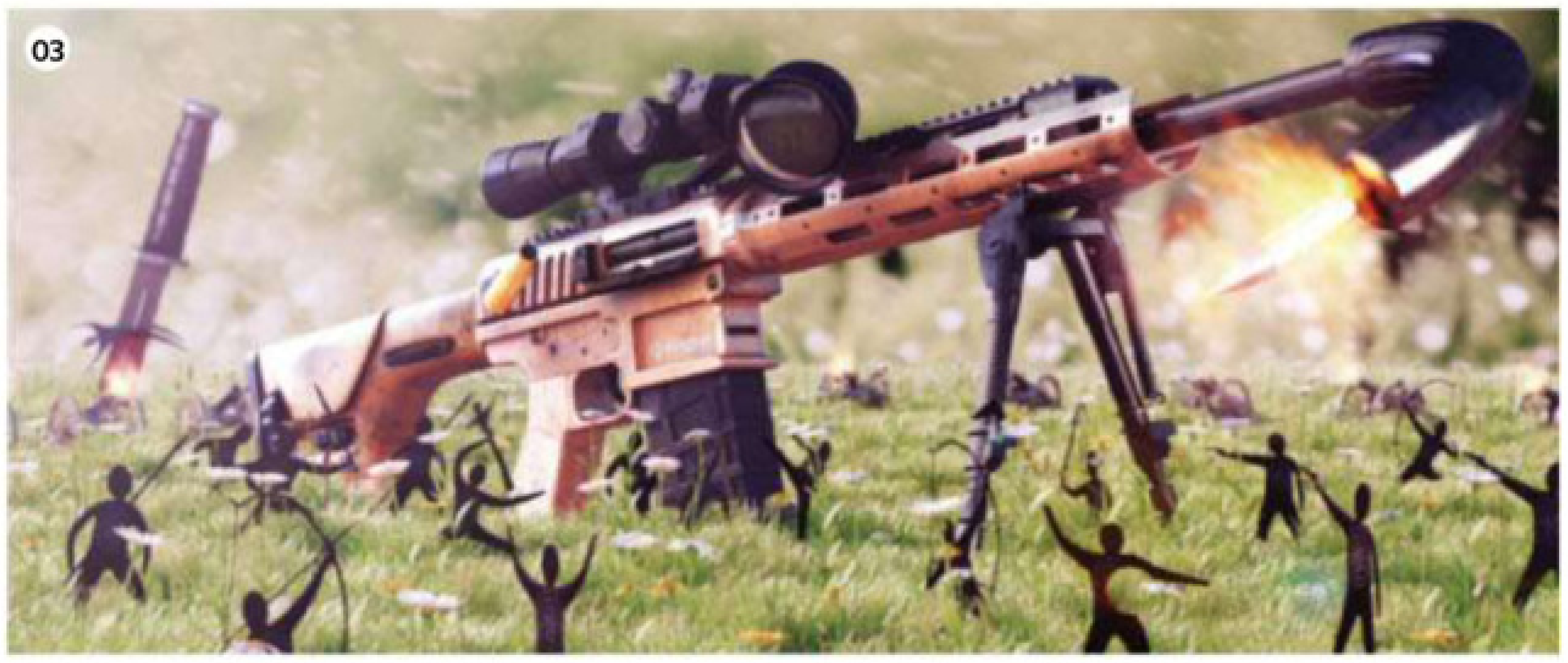
The node graph took about three hours to make, and the actual texturing process only took a few seconds as almost everything was handled procedurally instead of my having to manually paint it all.

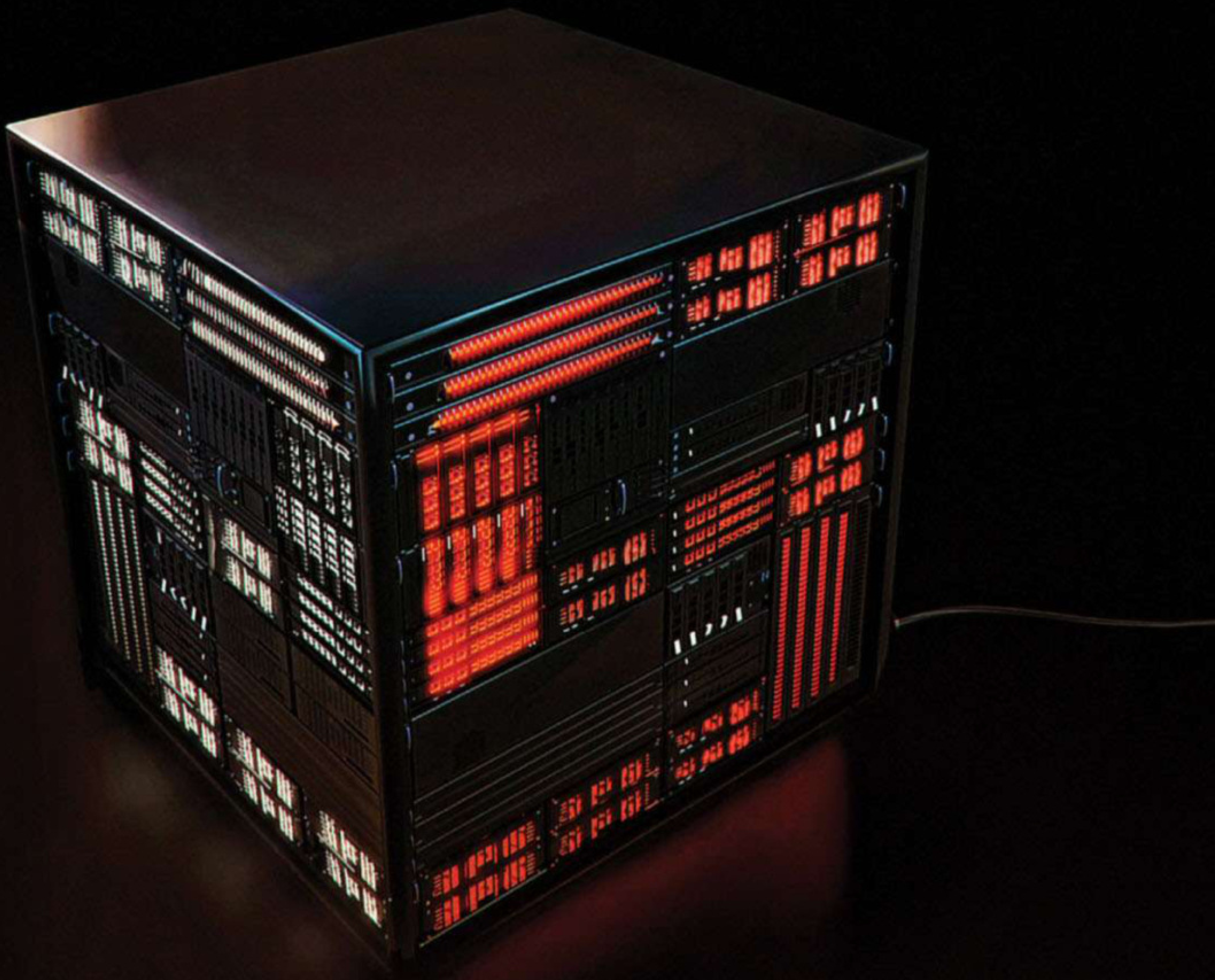


01 If Gibbons could do it again, he says he wouldn't have modelled a gun. "The realm of what can be a weapon is huge," he says. "I would love to have seen more work near the edges of what could be defined as a weapon, including from myself."

02 This was the very first time Liu Zinan had used Substance Designer for his work. Details such as scratches, rust and dirt were generated using Ambient Occlusion, a Curvature map and World Space Normal map to save time in texturing

03 Karalliyadda's second place weapon render imaginatively depicts the targets of his gun attacking the weapon





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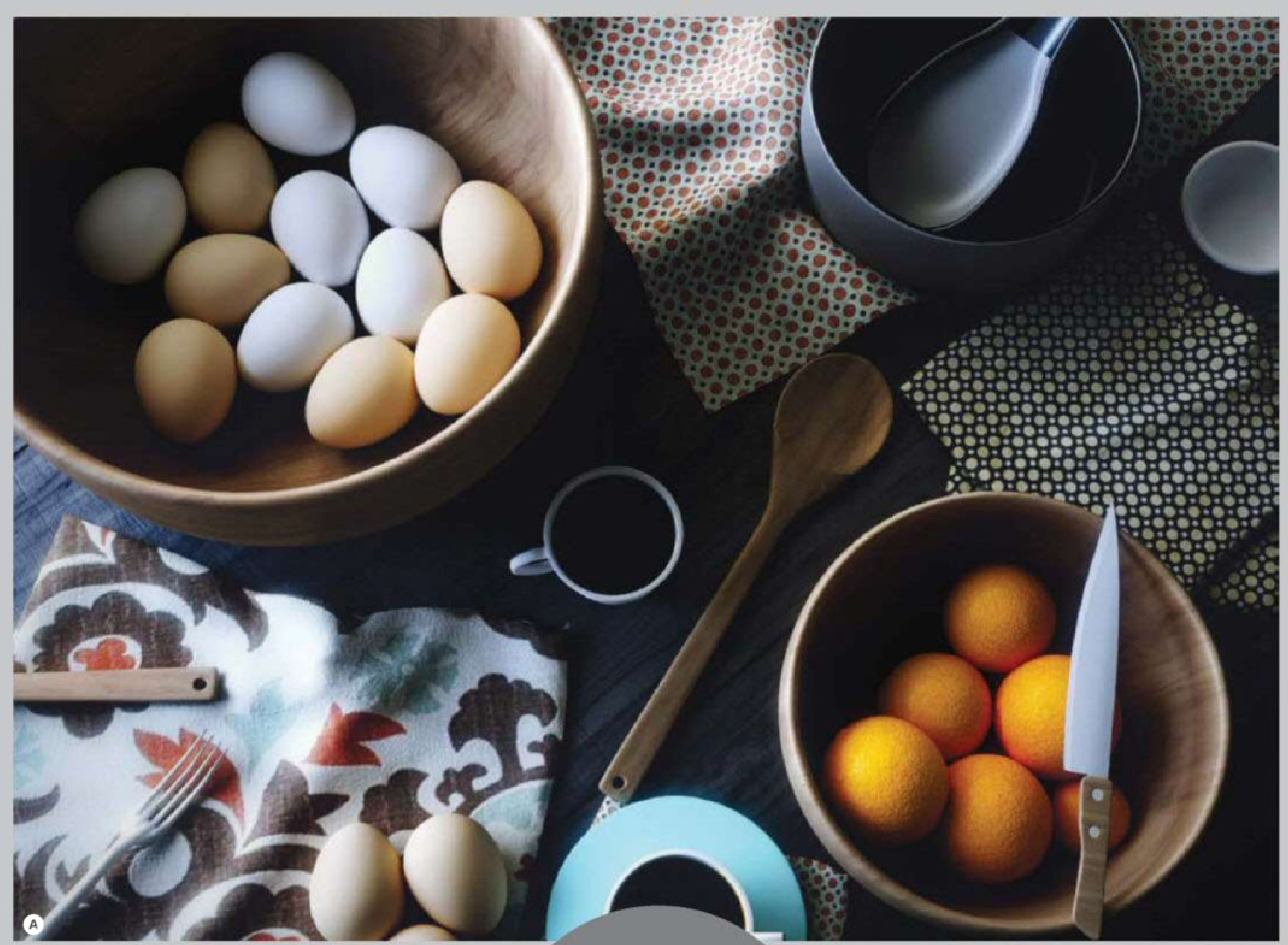

Images of the month

These are the illustrations that have been awarded 'Image of the week' on 3DArtistOnline.com in the last month

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Ⓐ Breakfast Table

» **Mohsen Hajizadeh**

3DA username Deeters

Mohsen says: " I did this render for the V-Ray tutorials group workshop #8. Imagine you are in a quiet place and full of energy. The Sun is up and the air is fresh and you want to enjoy your breakfast. Imagine it, because the ideas are stronger than the software!"

We say: *If we look at a 3D image of food and it makes us feel hungry, then the artist's job has been done! The materials and lighting used on this image are impressive.*

Ⓑ Ti

» **Maciej Zatwarnicki**

3DA username Bacteria

Maciej says: "The inspirations behind this image were Pris, a character from the movie *Blade Runner*, and Scottish actress Tilda Swinton. I wanted to achieve a fashion magazine-style shot. This piece taught me a lot about subsurface scattering materials and the process of rendering hair."

We say: *It was the connections to* Blade Runner *– one of our favourite films – that initially drew us to this work. However, it's the details, such as the hair and the material of the jacket, that kept us looking.*

Ⓒ Mad Cricket Men

» **Christopher Supardjo**

3DA username Christopher.Supardjo

Christopher says: "My first intention was to create a realistic insect. However, while doing so I was totally into watching *Mad Men*, and the result was this image! I love the set design of the series and it was fun creating the Sixties interior, giving it some retro colour when retouching it in post."

We say: *Sometimes it's fun to just have fun with a concept. Take something normal and then put it in a completely different environment – you'll be surprised at what you learn about your skills and the software you use along the way.*

Ⓓ Ferrari F1 Steering Wheel

» **Djordje Jovanovic**

3DA username Satori

Djordje says: "The aim of this project was to work with tools I never used before: CATIA and VRED. I was amazed by both tools and had a lot of fun along the way. Being able to work so fast and precise compared to standard poly-modelling methods is so refreshing."

We say: *We've always felt that F1 steering wheels look like something you'd expect to find in NASA shuttle. Djordje has captured the complexity in this brilliant study of the object.*

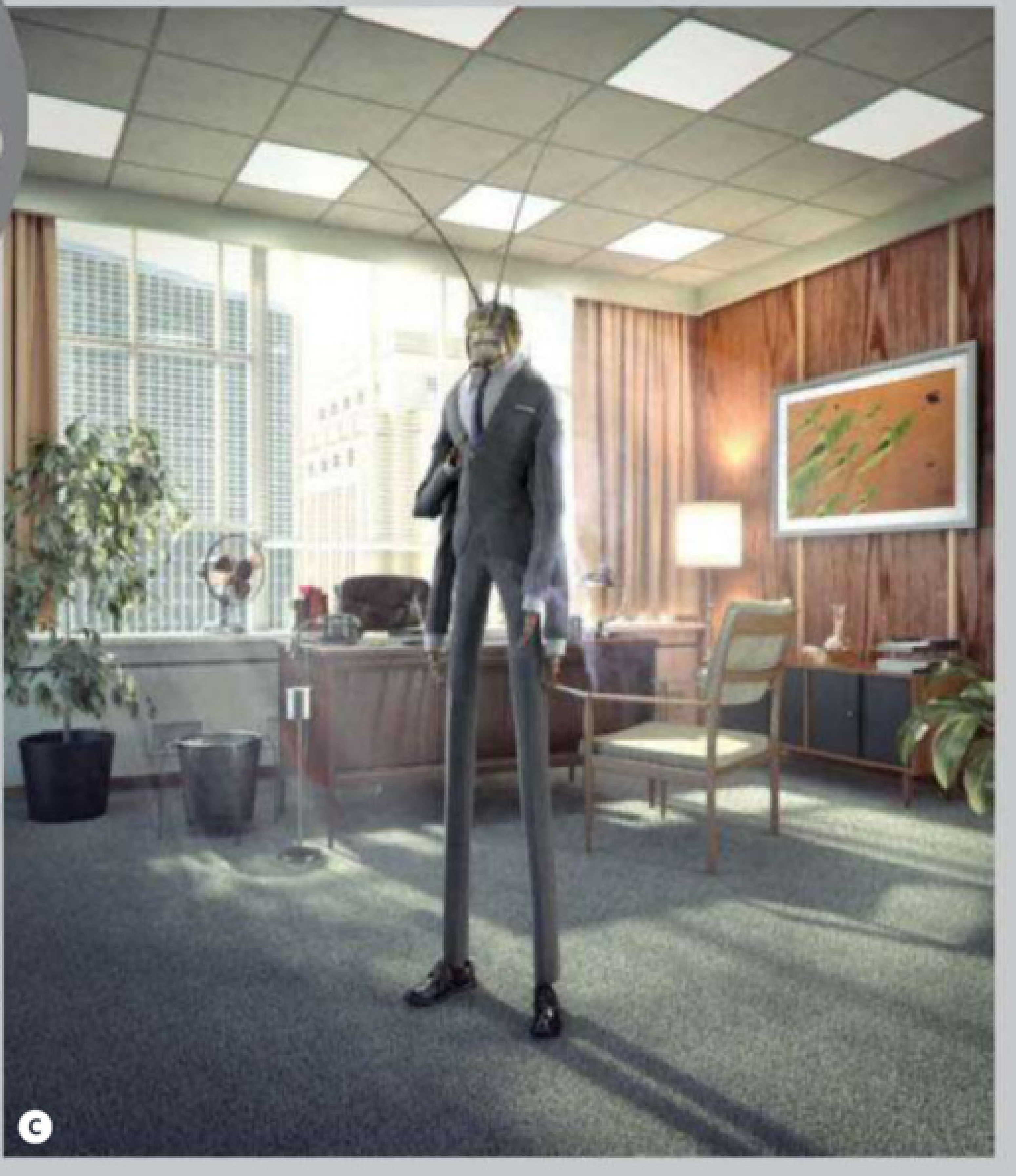
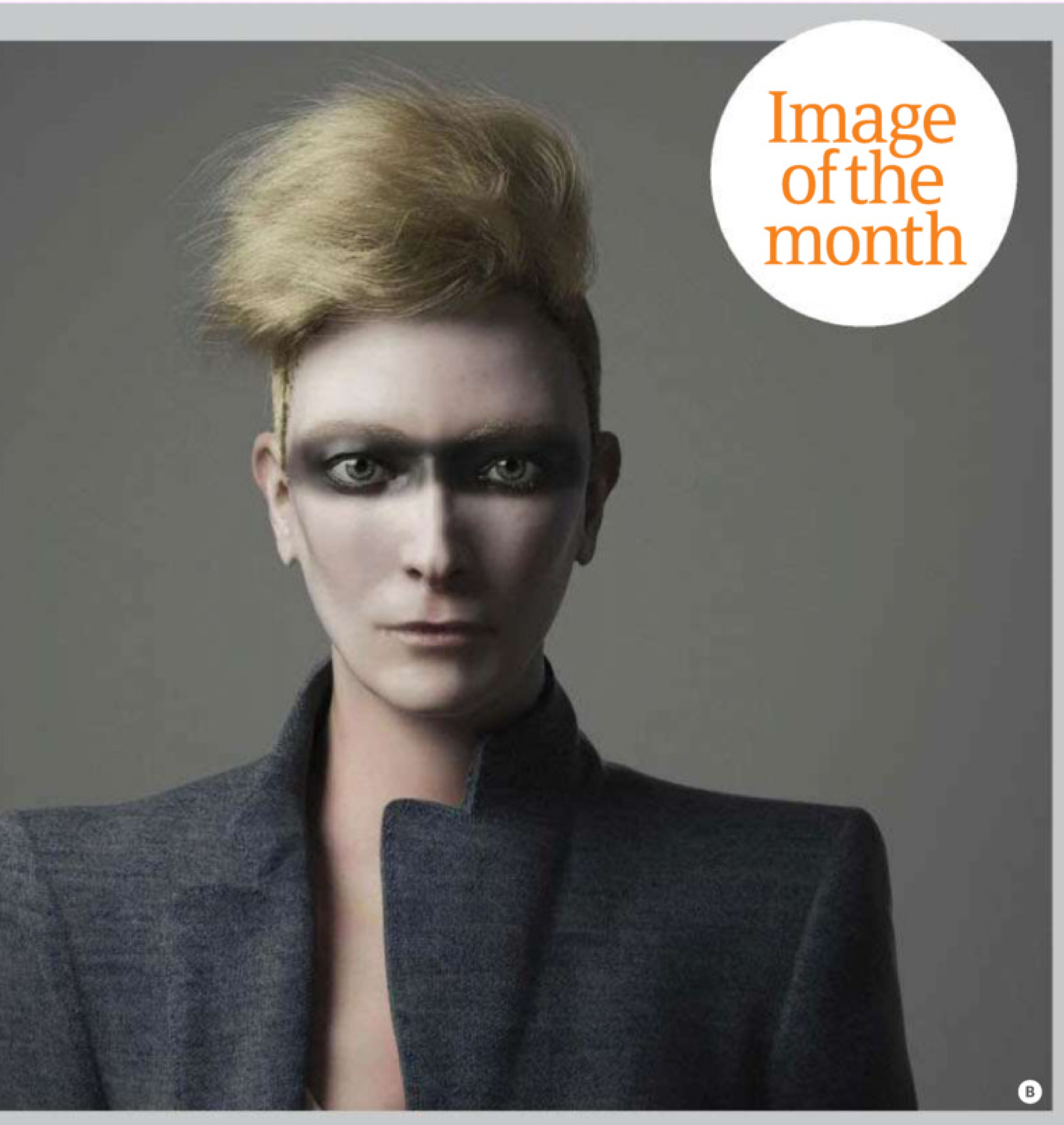
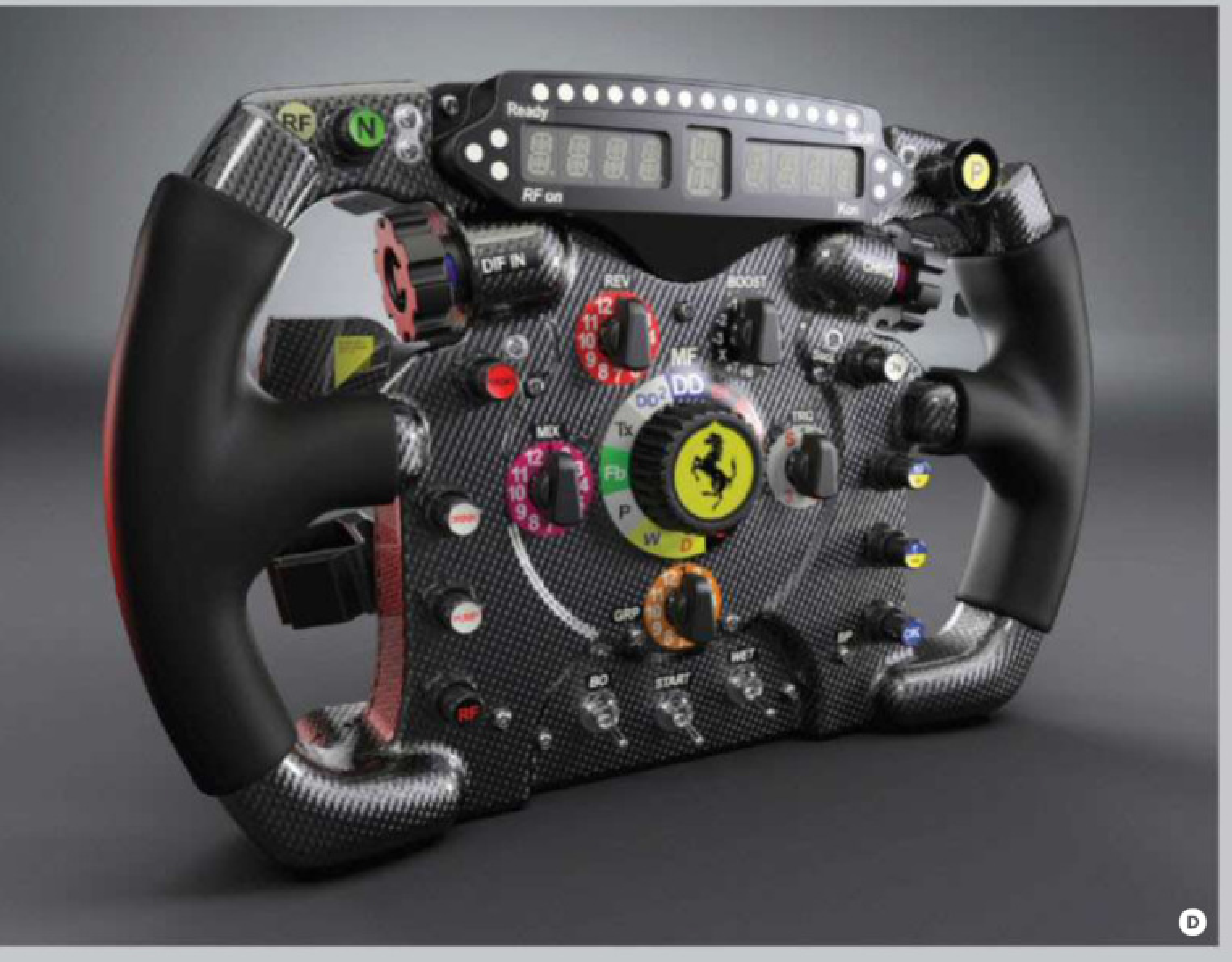
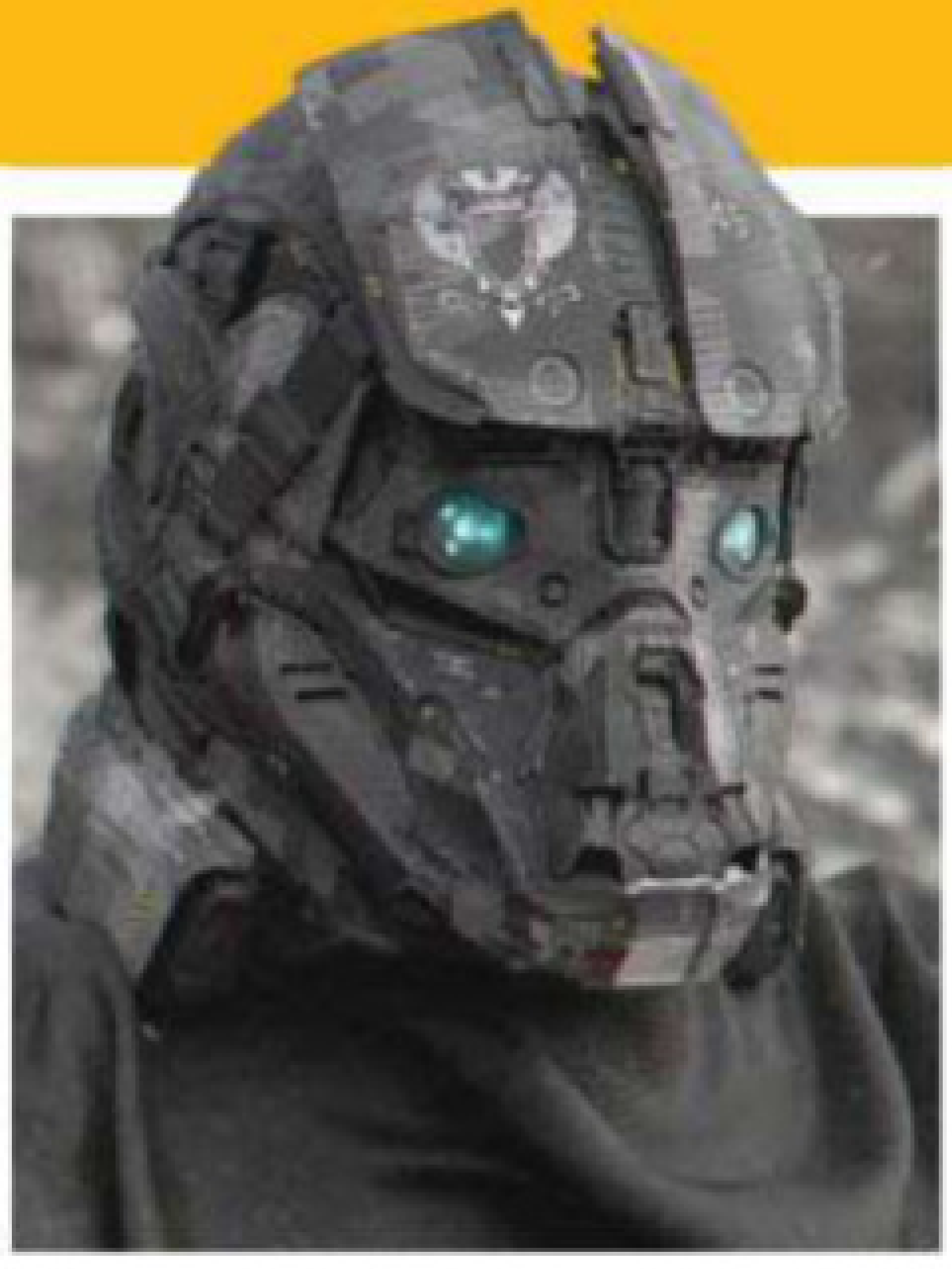


Image of the month







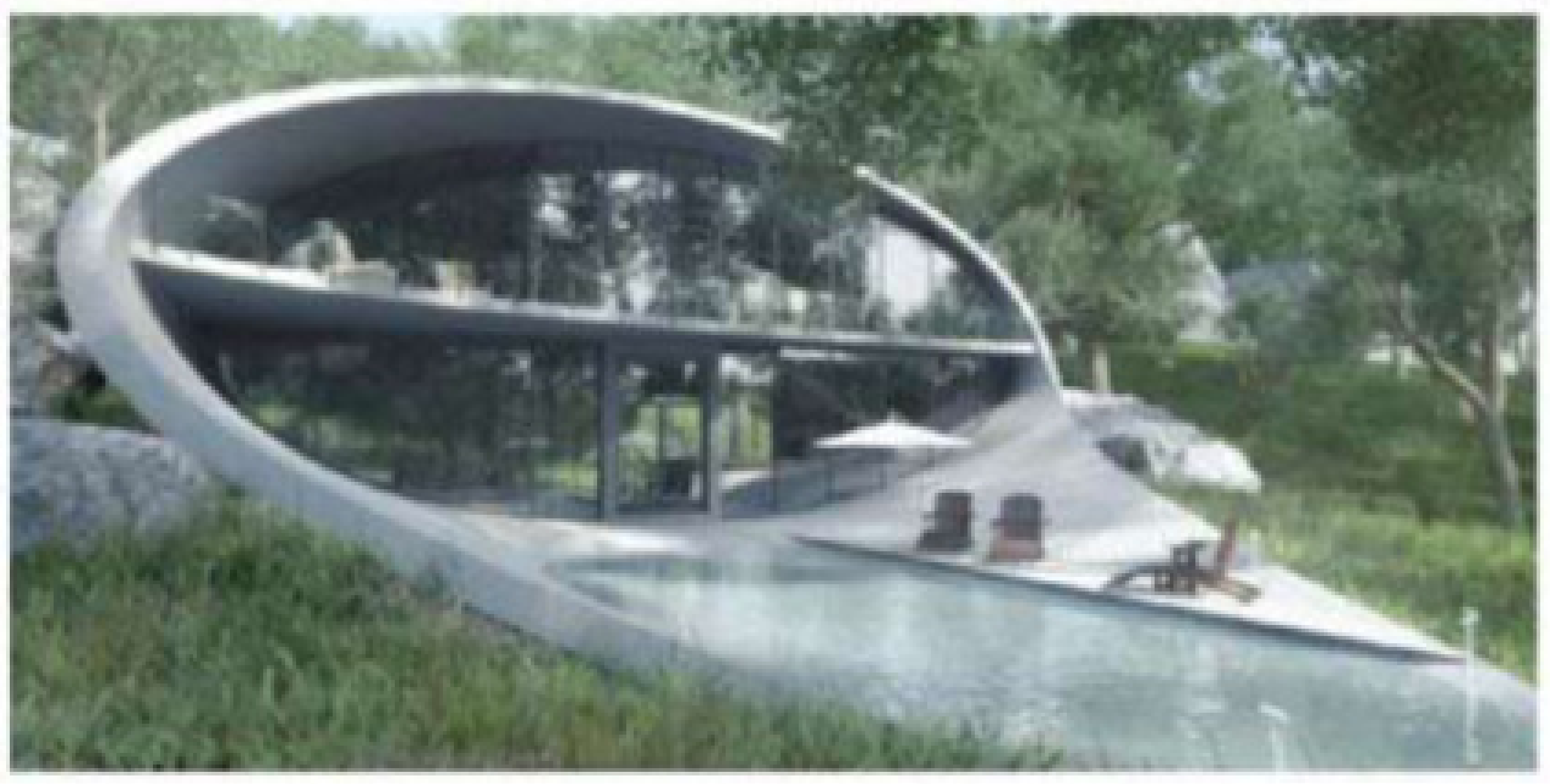
Warrior of Zenith

» **Stefan Misirdzhiev**

3DA username Chesher

Stefan says: "I tried out new techniques, having elements in the model both sculpted and traditionally modelled. I also tried out industrial design ideas."

We say: *These days, enhancing standard models with sculpted elements is the best way to go when creating robotic characters. Incorporating real industrial design elements into your models will also help to sell its realism.*



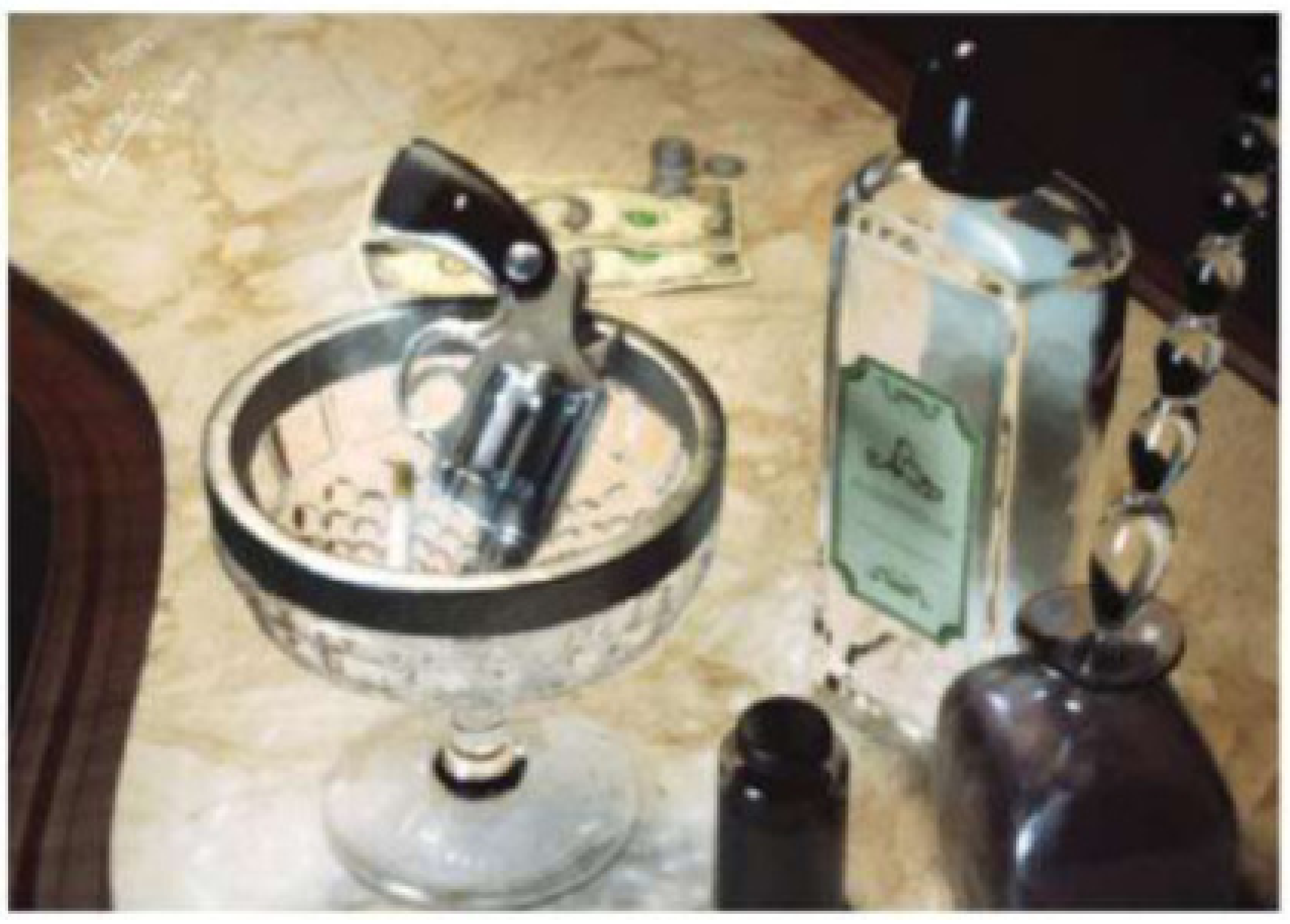
Curved Villa

» **Amir Moradi**

3DA username Amir_Moradi_

Amir says: "This is a personal project that I worked on. I used 3ds Max, V-Ray and Photoshop to create it."

We say: *When working on arch-vis – or almost any artistic project, really – always begin with simple shapes, then start adding complexity. Here, Amir has started out with a simple oval, creating a focus to the overall shape of the building that really helps to inform its structure.*



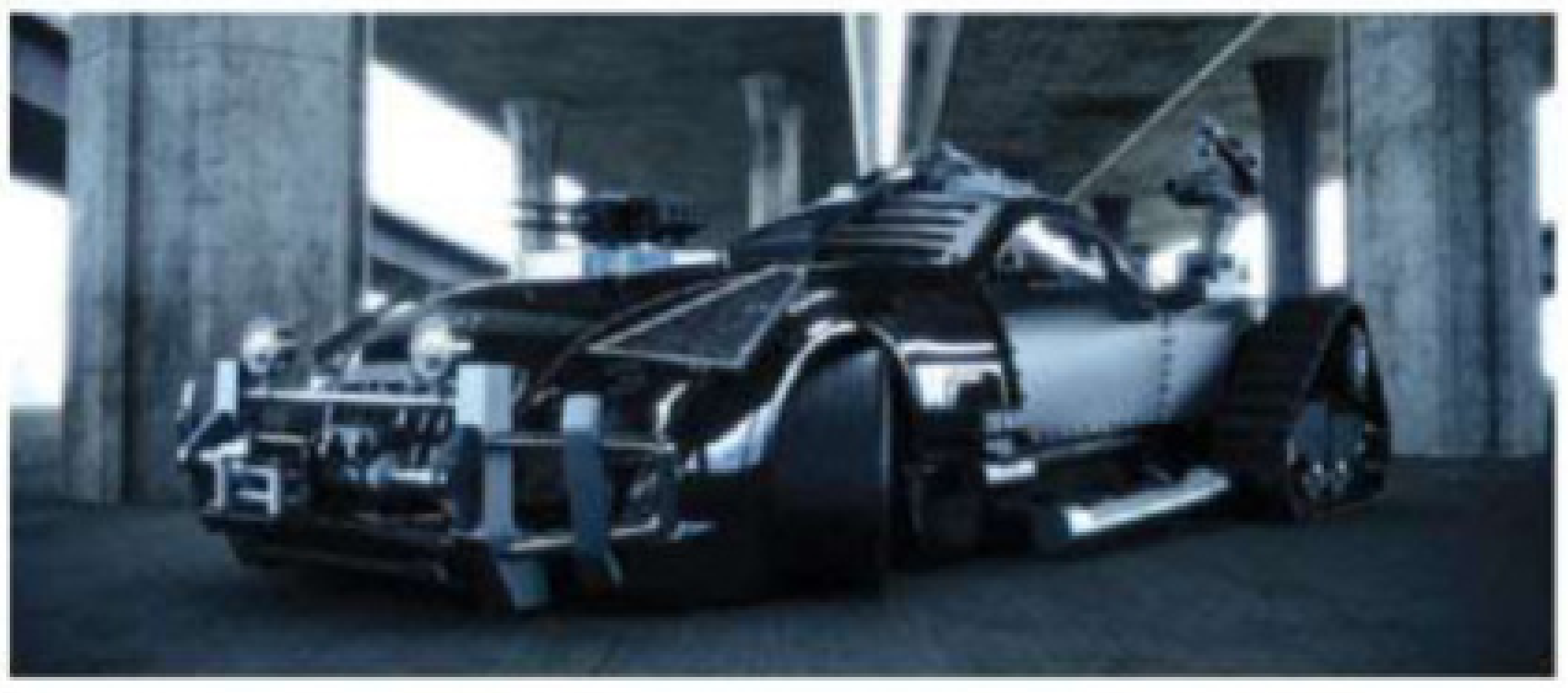
Hired Gun

» **Abdullah Sarfaraz Yeaseen**

3DA username AbdullahYeaseen

Abdullah says: "This is a table of a lonely assassin who kills for money. If you look closely you can see the bottle is from his wedding. The way he places the gun and the unfinished cigarette creates a certain atmosphere."

We say: *We've said it before and we'll say it again – images that convey a narrative will always grab the viewer's attention. The gun immediately conveys a feeling of danger; the unfinished cigarette a sense that it's not far off.*



Maybach Exelero

» **Khaled Alkayed**

3DA username Khaled_Alkayed

Khaled says: "This was modelled with Maya and rendered in V-Ray, with the environment from Evermotion Archexteriors Volume 25. I exported all the models in the scene from 3ds Max and imported them into Maya."

We say: *...aaaand now we want to watch Mad Max. We've always found there's something so fun about taking a regular vehicle and kitbashing it with weapons.*

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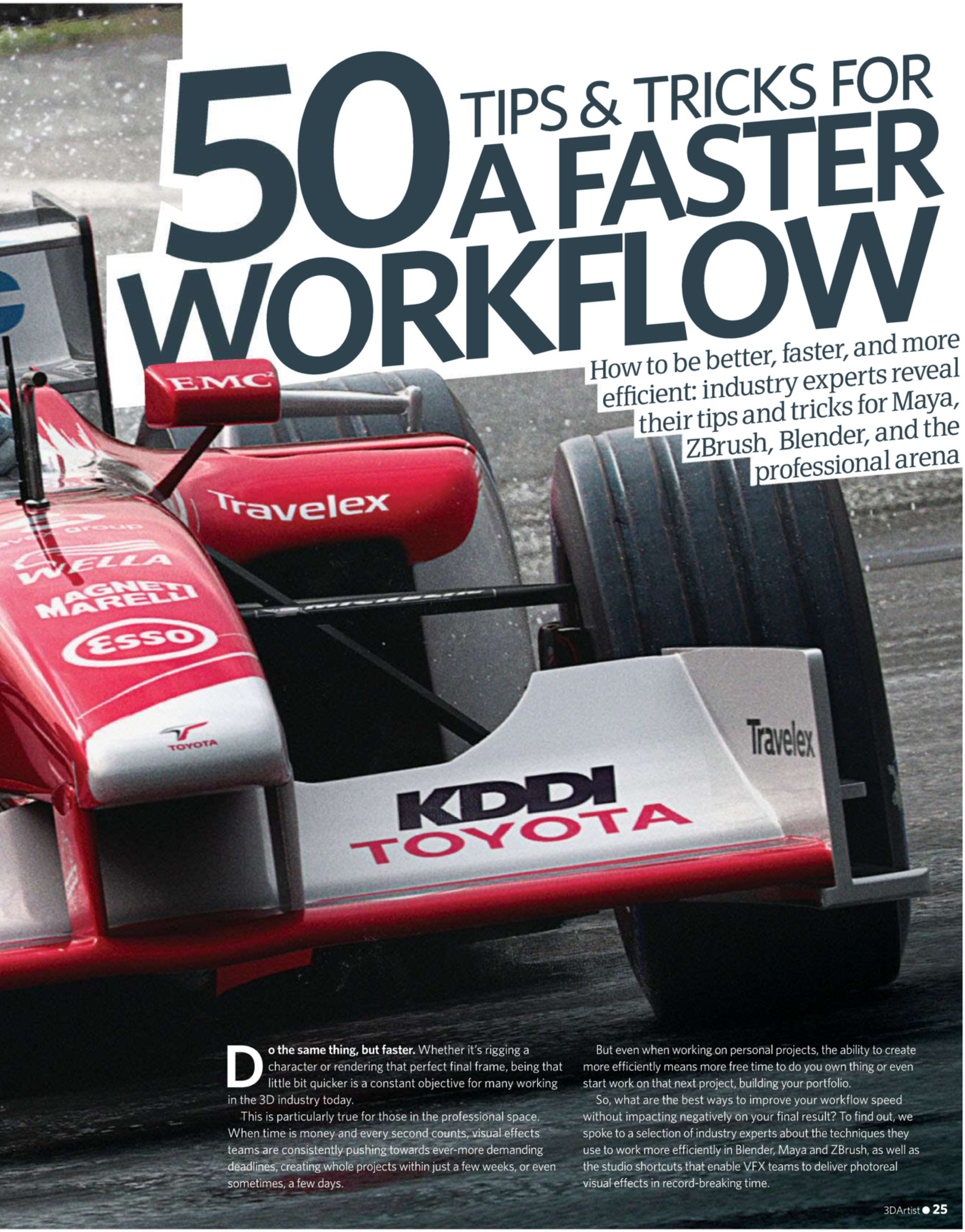


50 TIPS & TRICKS FOR A FASTER WORKFLOW

How to be better, faster, and more efficient: industry experts reveal their tips and tricks for Maya, ZBrush, Blender, and the professional arena

Do the same thing, but faster. Whether it's rigging a character or rendering that perfect final frame, being that little bit quicker is a constant objective for many working in the 3D industry today.

This is particularly true for those in the professional space. When time is money and every second counts, visual effects teams are consistently pushing towards ever-more demanding deadlines, creating whole projects within just a few weeks, or even sometimes, a few days.

But even when working on personal projects, the ability to create more efficiently means more free time to do you own thing or even start work on that next project, building your portfolio.

So, what are the best ways to improve your workflow speed without impacting negatively on your final result? To find out, we spoke to a selection of industry experts about the techniques they use to work more efficiently in Blender, Maya and ZBrush, as well as the studio shortcuts that enable VFX teams to deliver photoreal visual effects in record-breaking time.

Blender

THE EXPERTS

KENT TRAMMELL & JONATHAN WILLIAMSON
www.blendercookie.com
Full-time Blender artists and instructors at CG Cookie's Blender Cookie education site

ANDREW PRICE
www.blenderguru.com
Creator of www.blenderguru.com and the number-one Blender Youtube Channel and Facebook Page

01 Repeat the last operation One of the most basic workflow speed-ups for Blender's 3D View is the ability to quickly repeat the previous operation. Using the hotkey Shift+R, Blender will automatically repeat the most recent operation, including any tweaked options for the operator.

02 Local View This is a simple tip, but one that is particularly handy and can be used frequently. Pressing the forward-slash key on your number pad will isolate your selected objects in the 3D View. This Local View enables you to visually focus on a certain object(s) if your scene is complex or convoluted. Pressing forward-slash again returns the 3D View's camera and objects.

03 Add shortcuts to operators Make sure there isn't a shortcut assigned already by hovering your mouse cursor over any button and waiting for the description to appear. If you don't see a line beginning with, "Shortcut:" this means it doesn't have one. To add a shortcut, Ctrl/right-click the button and choose Add Shortcut. A text field will appear asking you to enter the combination. Note that if your shortcut conflicts with another, it won't work. You can see the full list of shortcuts by opening Blender's User Preferences>Input.

04 Precision manipulation Simply holding Shift while performing transformations and sliding property values enables more precise manipulations. This is useful when positioning an object perfectly over a reference image and for choosing a specific degree value when rotating. You can also dial in the precise amount of edge slide.

05 Use Shape Keys as modelling Layers Modellers can use Blender's Shape Key system to model non-destructively, similar to the layer system in ZBrush or Photoshop. This works great for testing shape changes or alternative poses without losing the original shape. The system also lets you mix and match Shape Keys in the list, so you can experiment with a wide range of results.

09

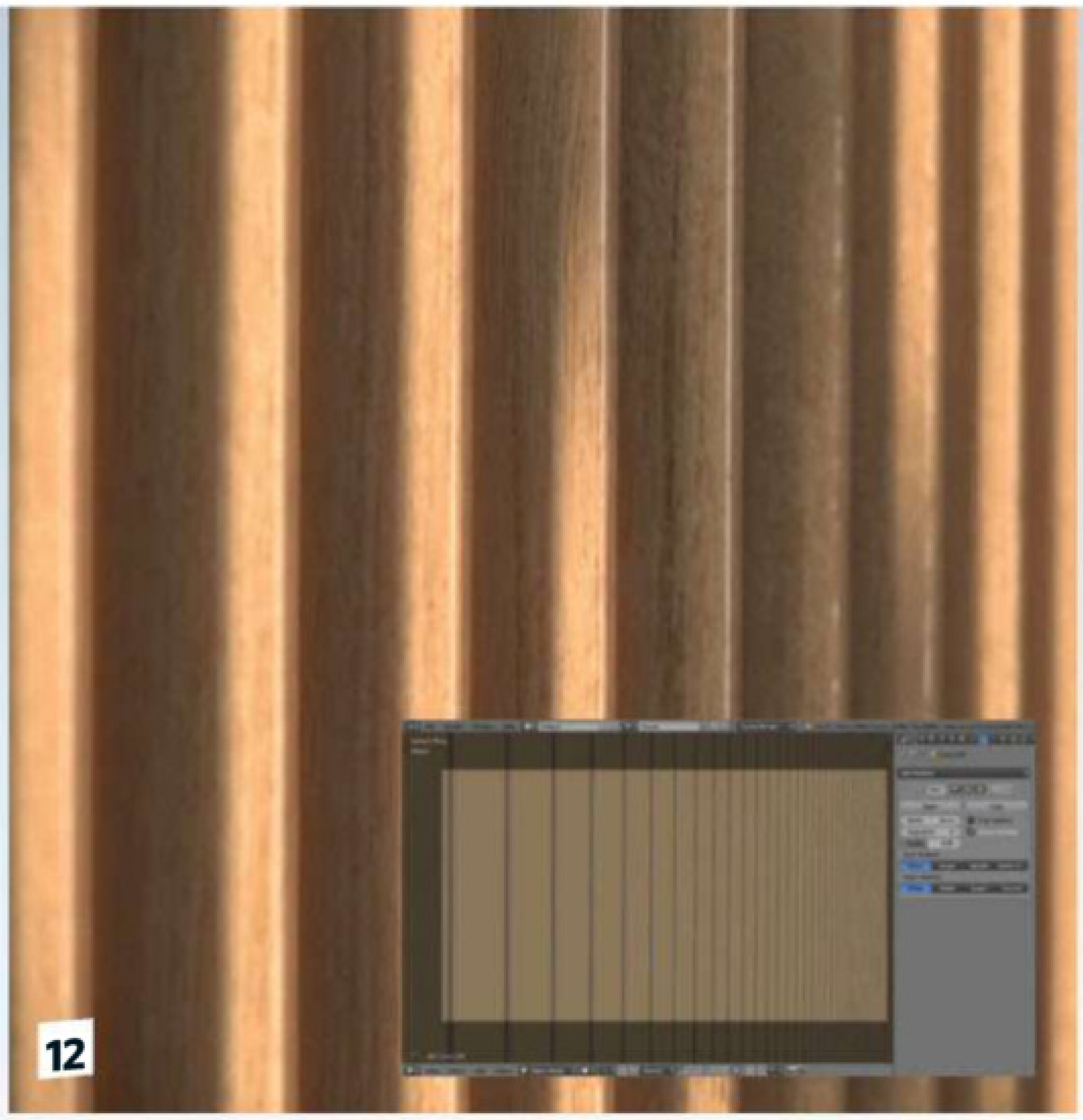
06 Filling/bridging polygon holes Blender comes with an add-on script that can significantly enhance a modeller's workflow. Enable the add-on in User Preferences>Addons by searching 'F2' and checking the box on the right side of the Mesh: F2 entry. Once enabled, you can fill quad-plausible mesh components by pressing and holding the F key. Filling and bridging quadded geometry has never been easier.

07 Displacement maps Instead of hand-sculpting details, you can achieve similar or even better results with Displacement maps. You can use a program called Knald to generate the Displacement maps from images, then in Blender add a Displacement modifier to the object, and in the texture panel add the Displacement map. Not only is it fast, but the geometry will match your image texture.

08 Cycles settings Cycles can now calculate and show Depth of Field without post-processing. Select the Camera, go to its Settings>Depth of Field, and in the Focus menu pick the name of the object you want in focus. For the Aperture, set it to F-Stop: 5.6.

09 Photorealistic lighting HDR skymaps are a must. They're 360-degree images captured at multiple exposure levels, so 3D software can find the bright spots to use as the light source. To use them in Blender, load it into the World Settings>Environment Map, and make sure to check Multiple Importance Sample under the settings. Go to the World Node Setup and connect a Math node set to Multiply, then duplicate it and set to Add. Connect both to the Output of the Environment node and the Strength input of the Background node.

> *SAVE TIME BY RENDERING ONLY THE PORTION THAT'S OF INTEREST, BY PRESSING SHIFT+B AND DRAGGING OVER THE CAMERA VIEWPORT*
>
> **ANDREW PRICE** WWW.BLENDERGURU.COM



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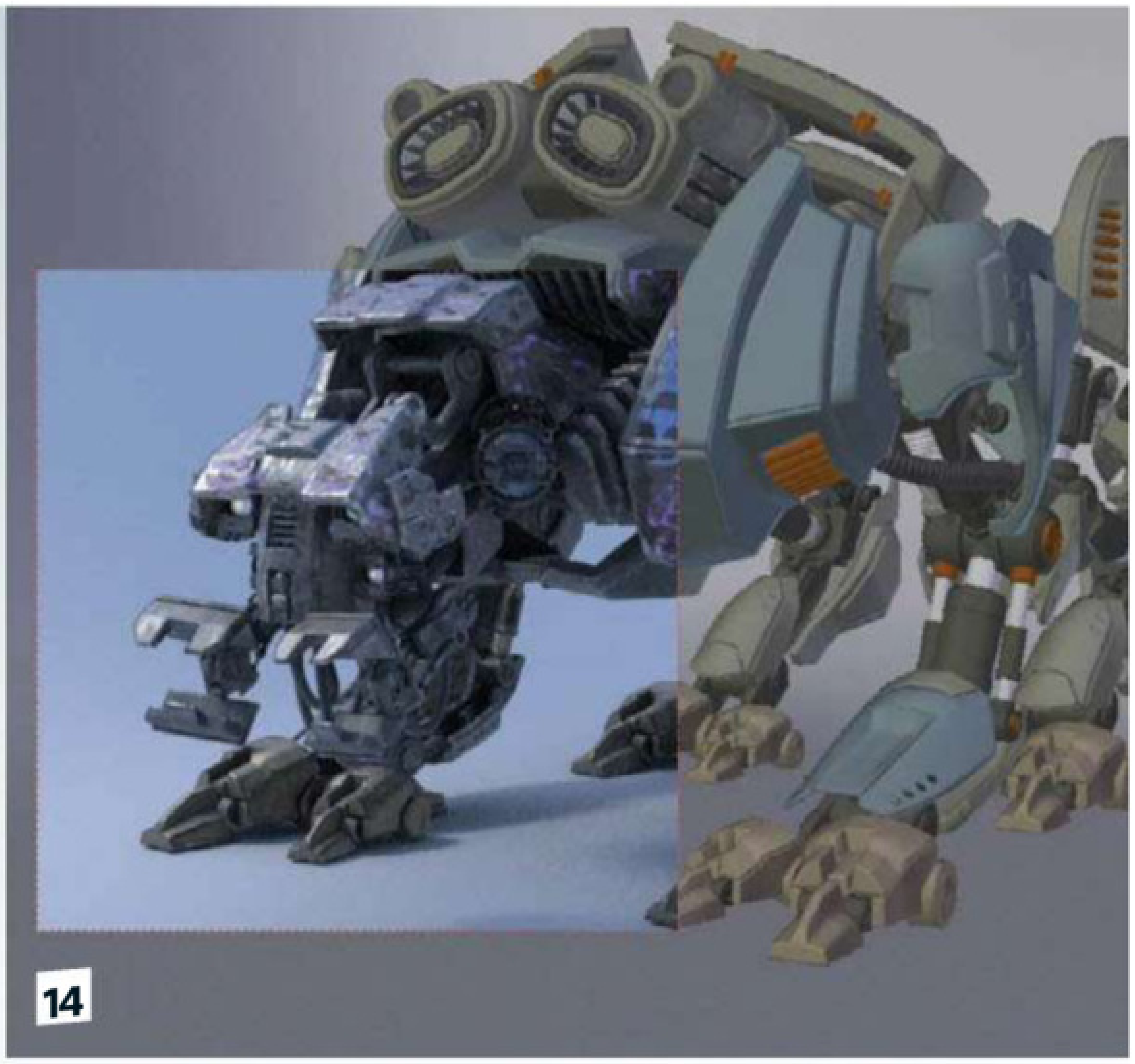

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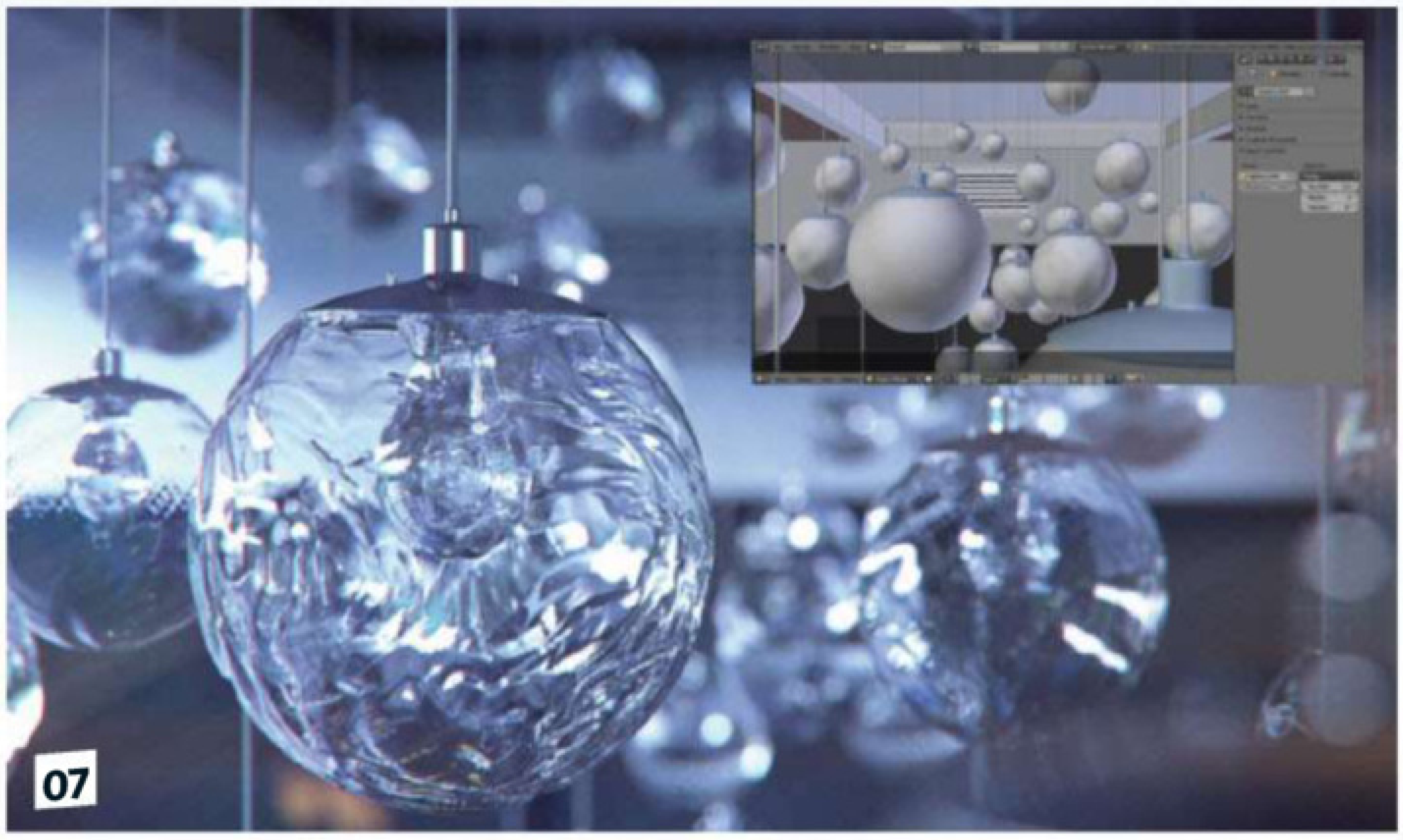


07

10 **Shortcuts and hotkeys** To save you from going back and forth between the 3D Viewport and the Node Editor, use the hotkeys Shift+F3 for the Node Editor and Shift+F5 for the 3D Viewport. Switch to Rendered View by pressing Shift+Z in the Viewport. Press it again to switch back. Switch between screen modes by pressing Shift+Left/Right Arrow. This will cycle you through the Compositing, Animation, Video Editing and so on. When modelling, you can quickly perform an edge slide by selecting a loop and double-tapping G.

11 **Easy duplication** Complex scenes can quickly eat up your GPU memory and crash the render. To save on memory usage, use Opt/Alt+D when duplicating an object instead of Shift+D. This creates an instance of the object instead of a copy, adding little to no overhead to the memory usage. This is especially useful for scenes with foliage, which typically use lots of memory. Just Opt/Alt+D the same tree till you fill your scene.

12 **Using a bevel** For realism, make sure to use a bevel, as no object in the real world is perfectly sharp. Add a Bevel modifier and increase the segments to further refine the bevel effect.

13 **Particle systems** If you need lots of objects, sometimes it's quicker to distribute them using a particle system. To do this, first select the object you want the objects to appear on, then add a particle system, set it to Hair, and under Rendered select the name of the object or group of objects you want to be distributed.

14 **Selective rendering** Instead of rendering the entire image, you can save time by rendering only the portion that's of interest, by pressing Shift+B and dragging over the camera viewport. To clear it, press Shift+B again anywhere outside the Camera View.

15 **Love the 3D cursor** The small cross-hair-like widget is infuriating for many at first, as it always seems to be in the way. However, it's also one of Blender's great strengths. The 3D cursor can be used as a custom transform origin, for object placement, and as the starting point of many modelling operations, among other things. To get started, position the 3D cursor with the Action Mouse (Left Mouse Button by default), and then change the transform Pivot Point to the 3D Cursor with the '.' key or via the Viewport menu.

CG IN ADVERTISING

Cédric Vermeirre (cedricvermeirre.com), the artist behind this feature's opening F1 image, talks about how he successfully managed his time in the advertising industry

"One of the things I learned in the advertising world is that time is crucial. We are one of the last links of the production chain and we have to cope with any possible delays. It all starts with pre-production. Sketch your idea on a paper and set up a basic composition. If you are working with other creative or clients, plan a meeting with them. Talk about the project to have a better understanding of what they really want and need.

Prepare mood boards and see that your client approves them too. At this stage you know which direction the image will take – what mood, what type of lighting will be used and which modelling part needs your special attention.

Keep in mind that clients who are not familiar with 3D jobs tend to get scared after being presented with preview renders of a raw model. They are not used to seeing an unfinished model without textures or decent lighting, so it's your job to reassure them by explaining the several stages of the process before it is done.

Clients like to be next to you as you work to give more feedback and directions from time to time. I can only recommend the use of a real-time renderer for this, as then the client can immediately observe and comment all the changes, without having to wait endlessly for test renders to finish."

Vermeirre stresses the value of preparation – it's just as important to working efficiently as the tools themselves

ZBrush

THE EXPERTS

OLIVER PABILONA
www.artstation.com/artist/OliverP3D
Freelance 3D artist

SIMON FENTON
www.escapestudios.com/simon-fenton
Lecturer in 3D for VFX at Escape Studios

HUGO SENA
www.sshart.weebly.com
3D character artist

16 Take advantage of ZBrush's customisable UI

Customise based on your needs, comfort, or for easy access. Consider whether you are left-handed or right-handed. If you're right-handed, you may find it easier to place commonly used brushes (without assigned short-cuts) on the right panel. Color Selector, Material, Texture and Alpha could be placed on the bottom panel. DynaMesh, ClayPolish, ZRemesher and a few more commonly used functions could also be at the bottom.

17 Shortcut keys

For the functions that you use every now and then, create Custom Menus. I have personally categorised them to four Custom Menus and assigned them to keys F5 to F8.

- F5 Custom Menu – Commonly used functions from Visibility and Masking panel / Deformation Panel / Geometry panel
- F6 Custom Menu – Stroke menu
- F7 Custom Menu – Insert brushes/mask, Clip, and Trim brushes/Hair brushes
- F8 Custom Menu – Everything on View menu

This Custom Menu idea is originally by Mike Jensen, but I adopted it and customised it with my version of ZBrush since 2011.
Hold Cmd/Ctrl+Opt/Alt-click on the Menu, Function or Brush to assign a shortcut key.

18 Save commonly used settings as presets

This is self-explanatory and pretty common, but it does save a lot of time, especially with brushes, light and render settings. If you have a good light setup, mainly for close-up shots, save it as a ZLI file. Or if you have a good render setup to show off the details of your sculpt, save it as a ZPR file. Render and lighting alone takes a fair amount of time to set up and refine, but if you have the settings saved, you can just load them as needed.

19 Pre-work, research, references

Do your research before even starting to use ZBrush. I cannot stress this enough. Researching for references doesn't just give you a set of pictures to compare your sculpt to. The research part also trains your eye to watch out for what is visually acceptable for the design direction or theme that you want to achieve.

20 Creating a clean mesh

The geometry tools in ZBrush are amazing. If I have scan data that has big holes and poor topology that needs fixing, then utilising the geometry tools will fix most problems very quickly. A little bit of Decimation Master at 99.9 per cent decimation basically fixes it without really removing any polygons. You could then use Fill Holes to fill the back with polygons and then make use of the magical ZRemesher to retopologise to quads. With just a few clicks of a button, you will have a clean, well-structured mesh.

21 Take your time

Always remember that taking your time can also mean saving time. Focus on each part as it comes. Time-constraining yourself might sound bad, but it's important. It will help you focus on the essence of your project and on the forms rather than letting yourself be lost in details. Building silhouettes first will help define your project and give you goals to work towards.

22 Study from the masters

When working on an anatomy project,take a look at the masters (Giambologna, Vasse, Michelangelo). Their sculptures are full of information for you to decipher and to learn from. For extreme posed characters, gymnastic and dancing photos are the best. The more you study your references, the faster you will become at sculpting those forms over time.

23 Watching is as important as sculpting

Artist's block can be as big a hindrance to getting work done as not knowing the tools. If you suffer from it, go to a museum or an art gallery. Giving your mind some time to rest is important, and considering other people's work will help you get back to your workflow.

24 Practice by creating something new every day

Try and create one character a day, but don't be afraid if you can't finish them at first. Speed won't come from being fast, but from knowing what you are doing and getting there with fewer strokes. You will find that over time your speed will eventually increase with each sculpture – finished or not – that you create.

25 Build a base mesh

When I first started sculpting, I started on each sculpt with a ZSphere. However, I gradually realised that this was taking up a lot of time, mostly because I had to separate polygroups each time. So, I decided to build a base mesh. It's quite clunky, and the proportions are off, but the most important thing was that all of my polygroups are well defined. This made it a lot faster and easier for me to pose the sculpt and work on each element.

16

19

22

Use references to work realistically, but also to keep you from being distracted from your goals

© Oliver Pabilona

SCYTHE ANATOMY PROJECT

THE WORKFLOW THAT CREATED ONE ZBRUSH SCULPT A DAY

3D character artist Hugo Sena first began his Scythe Anatomy Project in 2013, a time when he was dissatisfied with his skills and workflow. "I decided to challenge myself with 30 days of sculpture, one character per day. It eventually lasted all the way to mid-February," Sena reveals. He didn't even make use of usual shortcuts – to maximise his learning of form, rhythm, flow and the anatomy of the human body, he insisted every sculpture had to be posed and sculpted without using symmetry to help.

"As far as the tools I used, it was nothing fancy," he continues. "It was the Clay brush most of the time, it's a wonderful brush and gives a nice sense of flesh. The Standard brush was used too, as well as the Dam Standard for carving and a nice smooth tool for the end. After that, it's a fairly straightforward process: I look for references of a pose, a sketch, a photo or even myself. Once I have it, I start to work on the face. As my base mesh isn't well proportioned, I prefer to do a fairly detailed head and then check back on all the proportions with my head as reference.

Once all the landmarks are put in and I know the proportions are good, I proceed to pose the model. Once posed, I crank up the mesh resolution to the maximum (I'm usually between 400k and 1.6m top) and start sculpting."

In an attempt to learn more about the art of sculpting, Hugo Sena created a new sculpt every day for 30 days

Maya

THE EXPERTS

ALEX WILLIAMS
www.animationapprentice.org
Animator and tutor at Animation Apprentice and Escape Studios. Film credits include *Who Framed Roger Rabbit?*, *The Lion King*, *The Iron Giant*, the three latest *Harry Potter* films, and *The Chronicles Of Narnia*

MARK SPEVICK
www.escapestudios.com/mark-spevick/
Head of 3D at Escape Studios. Worked with director Martin Campbell on *Zorro* and *Mask Of Zorro* before supervising on the set of *Casino Royale*

PATRICE PARADIS
www.autodesk.co.uk
Autodesk Pre-sales Engineer

JAHIRUL AMIN
www.jahirulamin.com
3D generalist with three years' teaching experience in computer animation at the NCCA while also contributing regular articles to **3D Artist**

27

26 Establish a screen layout and save it The standard animator's layout is a three-panel view split at the top. To find this in Maya, go to Panels>3 Panel View>Split At Top. Customise the view, then save the layout so you can retrieve it each time you open Maya. Go to Window>Save Current Layout and name it Animation View. Retrieving this will be the first thing you do when you open Maya.

27 Create a camera and lock it off You want to set up your camera straight away, else you will waste time animating stuff that the audience will not see. To create a camera, go to Create>Cameras>Camera and name it Shot Camera. Go to Panels>Look Through Selected, and move your camera into the right position. Once you're happy, select your camera, Ctrl/right-click on it, and lock it off in the Channel Box.

28 Relax your rig Almost all animation rigs are designed in the T pose, which is stiff and formal, so you need to relax it. At frame 0, relax your character. Bend the knees, bend the arms, give the face an expression. Offset the feet a little. Save this pose on frame 0, outside your timeline, so you can come back to it when you need new poses.

29 Block out everything from the start You should add eyebrows, eyes, fingers and facial expressions on all your poses. Offset the symmetry, make each key pose expressive. Facial expressions will help to sell your shot. Don't think 'I'll do the facial expressions later'. Do them now.

30 Don't animate on the World Mover The World Mover is for moving your rig into position at the start of the shot, and for nothing else. Except in rare circumstances, don't animate on the World control. Set a key on the World Mover once, when you move the character into position, Then, never touch the World Mover again.

31 Download the TweenMachine The Tween Machine is a free Maya plug-in that makes the work of adding breakdowns to your shot incredibly easy. Download it, install it, and never look back at **www.creativecrash.com/maya/script/tweenmachine**

32 Create a custom button I often get asked by students how to make your own custom button for Maya's shelf. Simply hold down Cmd/Ctrl+Shift while selecting your tool. As if by magic a shelf button will appear complete with icon.

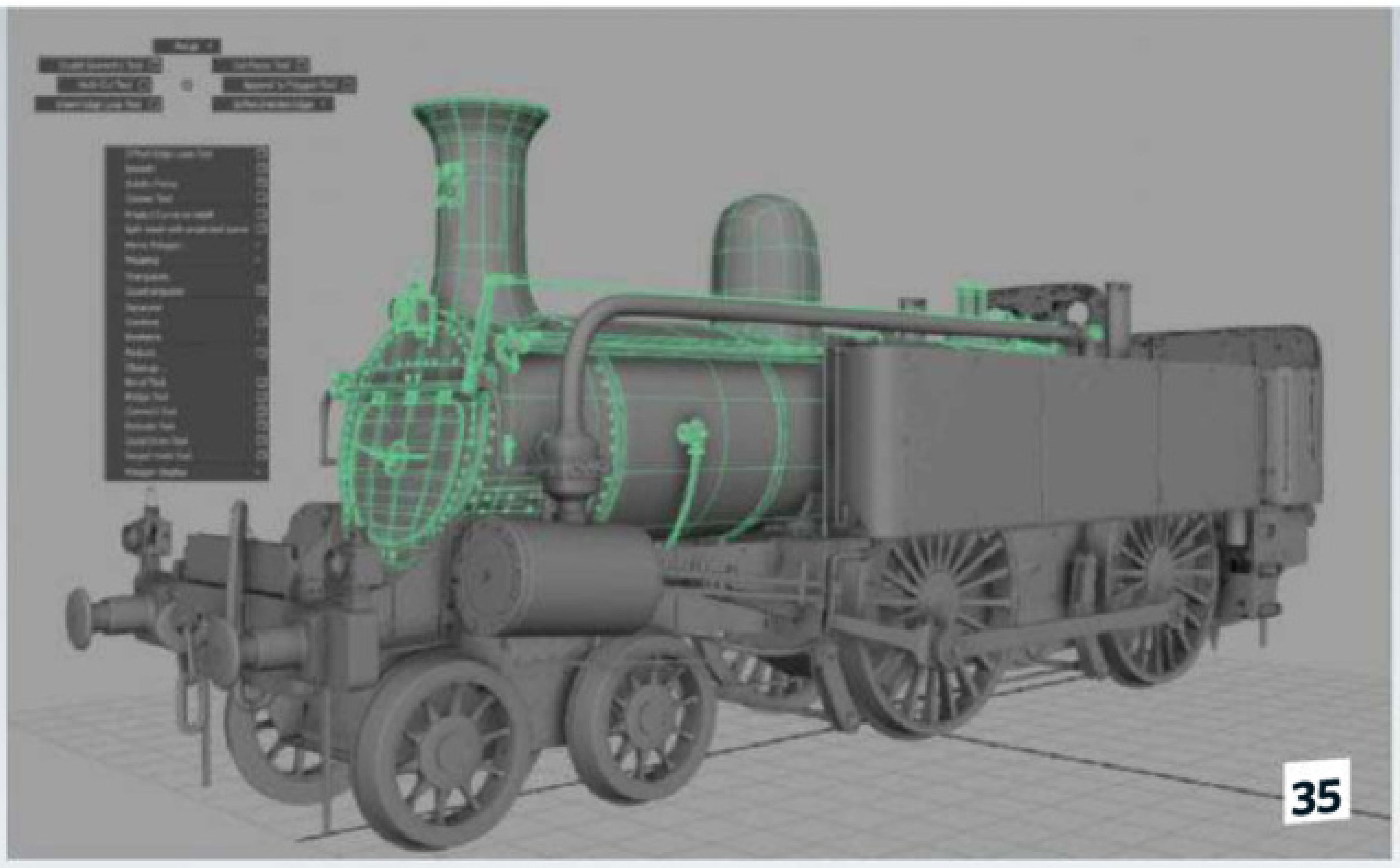
SET UP YOUR CAMERA STRAIGHT AWAY, ELSE YOU WILL WASTE TIME ANIMATING STUFF THAT THE AUDIENCE WILL NOT SEE

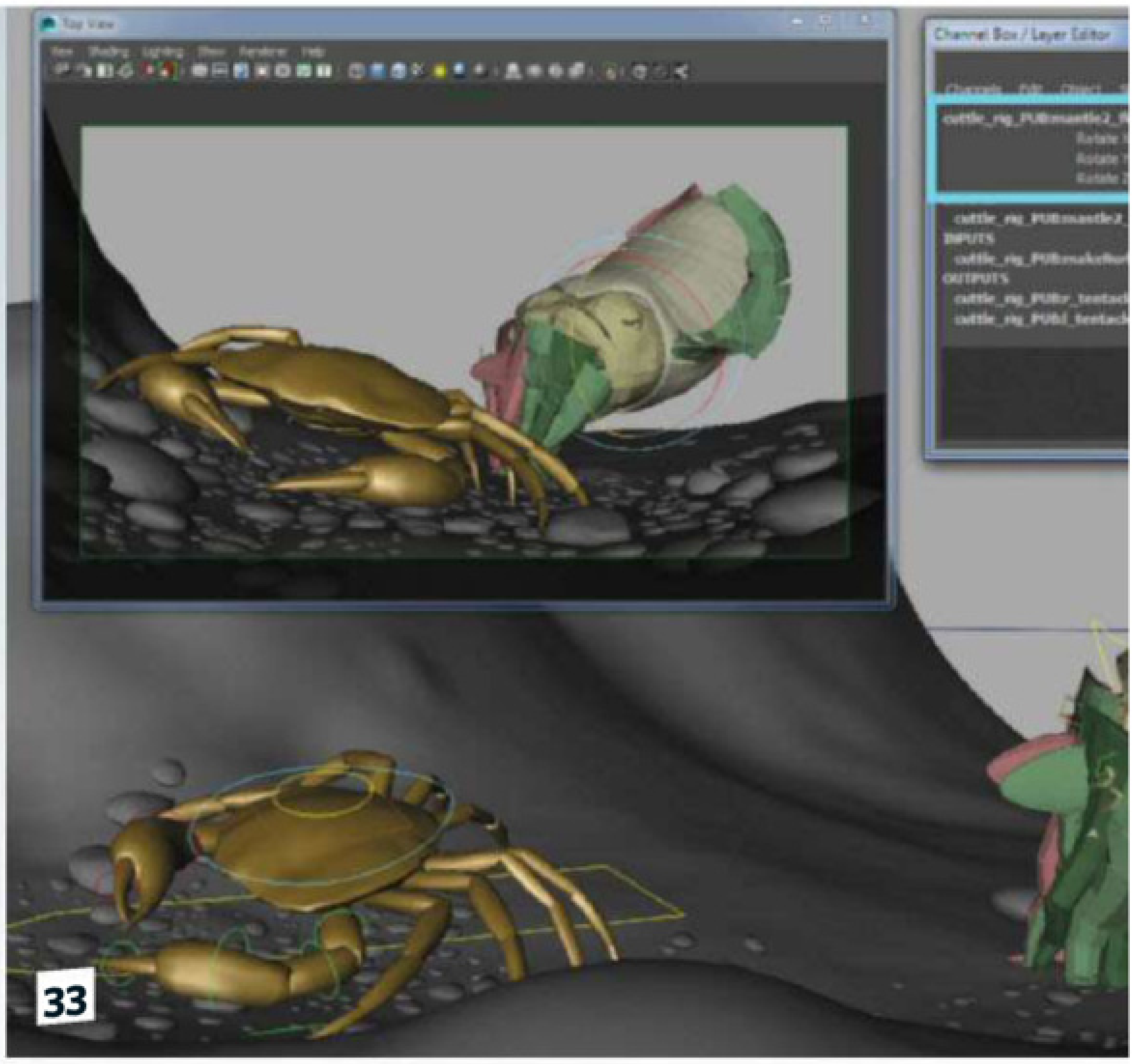
ALEX WILLIAMS
WWW.ANIMATIONAPPRENTICE.ORG

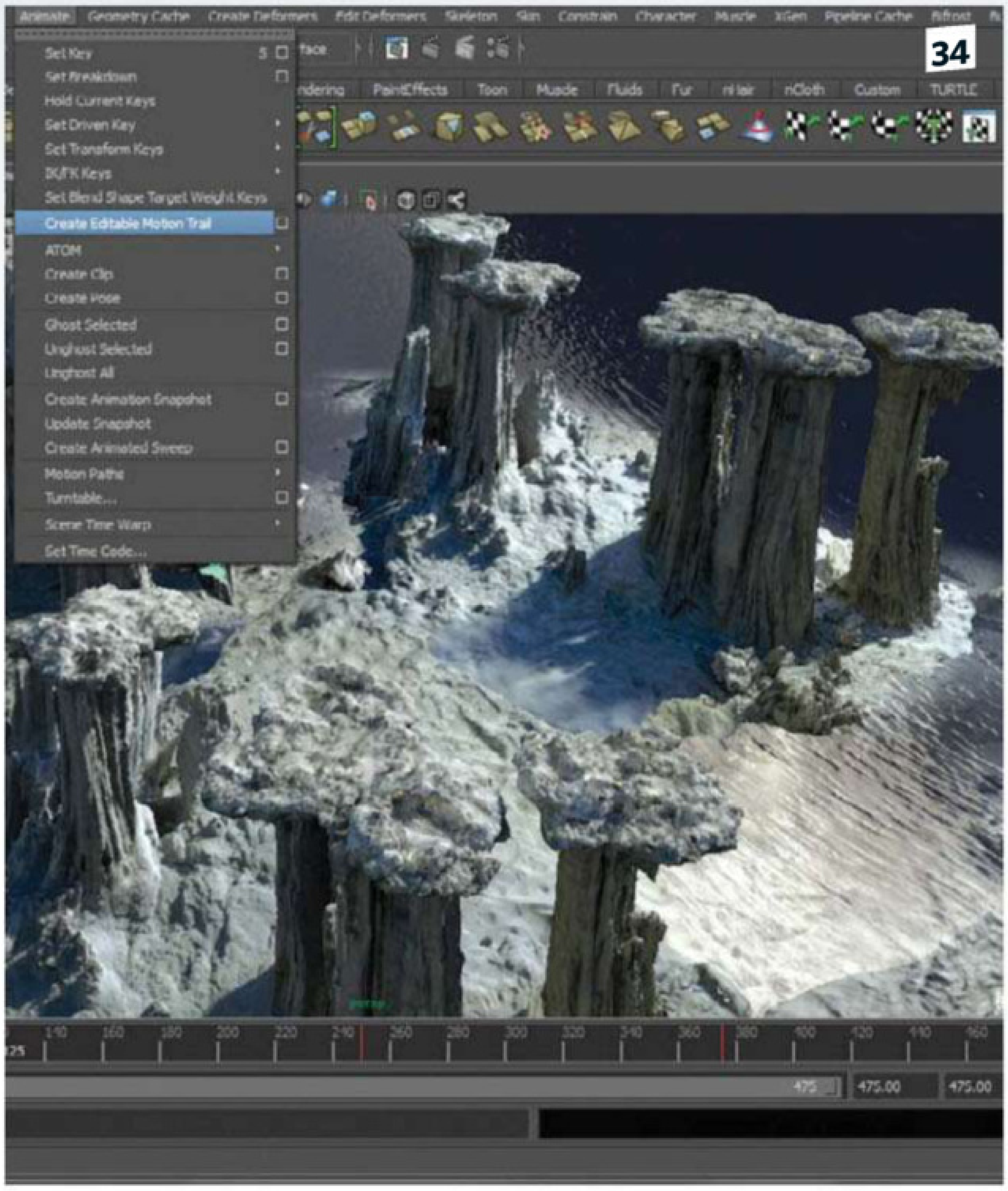
33 Change the viewport background A quick way to change your background colour in the viewport is to press Opt/Alt+B and you can cycle through various colours, such as black, grey and blue gradient to mention just a few.

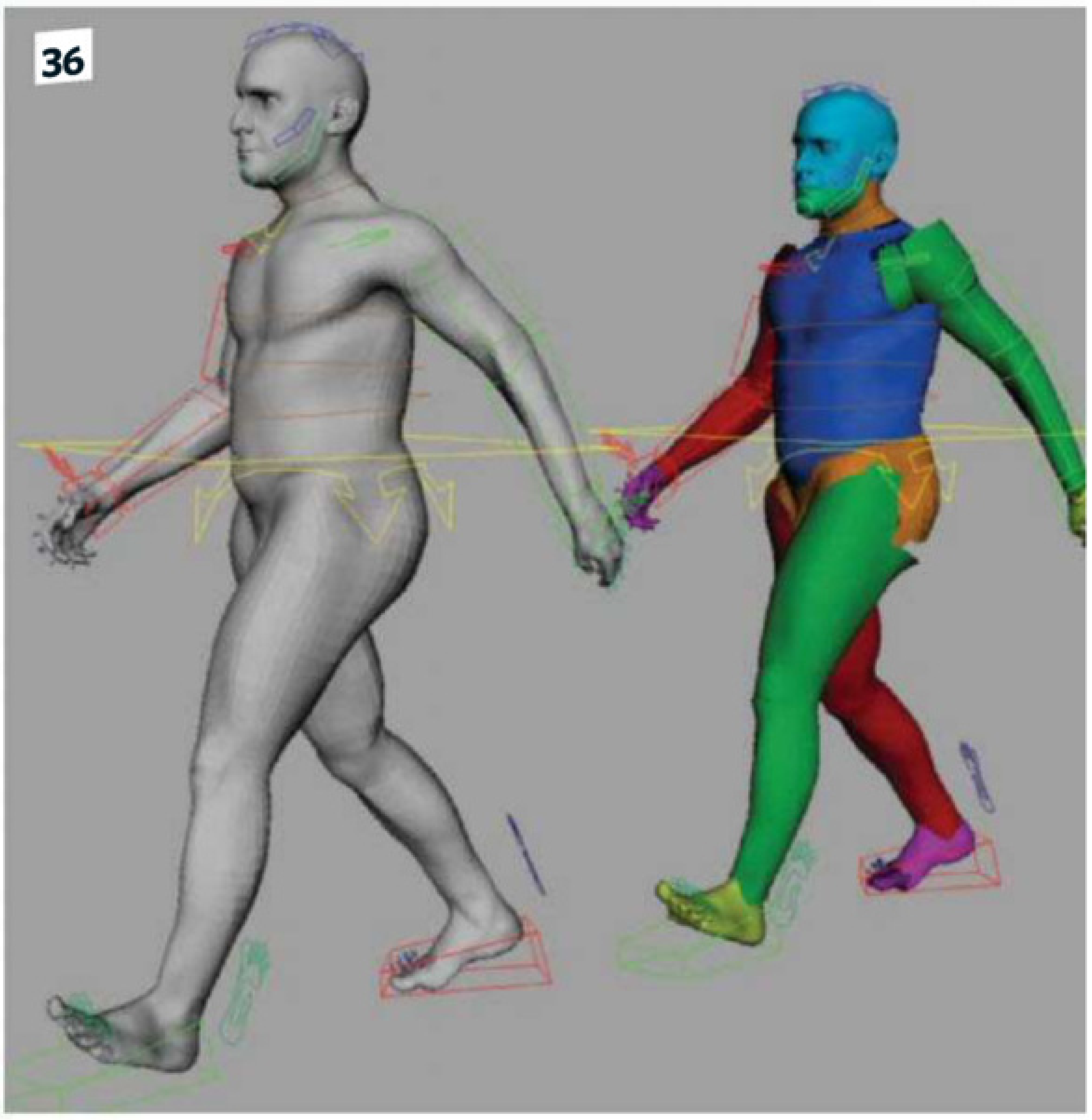
34 Editable Motion Trail One of the most useful features is Editable Motion Trail, which enables you to preview your animation and interactively adjust your keys, timing, tangents, and position of animation within the 3D scene. Rather than going inside the Animation Graph Editor window and adjusting your keys, go to Animation Menu>Animate>Create Editable Motion Trail Options and apply based on the desired options. This will automatically display in the Maya viewport the interactive tangents on the Motion Trail for any key with editable tangent types. You can add extra keys at any time, move the Transform keys directly in the 3D space, and it will allow you to control your animation in a much more natural way.

35 Use the Marking Menus Maya has plenty of Marking Menus, enabling you to easily access the common tools you use. For example, with a polygon object selected, holding down Shift+RMB will bring up a Marking Menu with tools such as the Sculpt Geometry tool, the Multi-Cut tool and the Insert Edge Loop tool. If you use the same shortcut with a face, edge or vertex selected, a Marking Menu relevant to the selected component will pop up. Furthermore, you can always create your own custom Marking Menus to quickly access your favourite tools.









36 **MEL and Python** For some, the words MEL and Python may send a shudder down your FK/IK spine. It's possible to go about your work without having to do any scripting, but you should embrace it. Repetitive tasks will be done in minutes, freeing you up to be more productive.

If you don't know where to start, jump into the Script Editor. Better still, enable History>Echo All Commands to really get a clearer insight into what Maya is doing under the bonnet.

37 **Animate in real-time** Creating a Playblast is the best way to check your progress, but if you having to create five to ten Playblasts per hour, that's a lot of time wasted. Create a low-res proxy of your character by chopping up the model and then parenting the pieces to the skeleton of the rig. The skinned mesh can then be hidden and the proxy mesh will give you the real-time performance.

38 **Delete unnecessary history** If you are working on a model for days, weeks or even months, every extrude, every edge loop added or vertex deleted is recorded. After a while, you may find that there is a bit of a lag as you navigate your scene. The best thing to do is to simply delete the history of the model by going to Edit>Delete By Type>History. I tend to delete the history on a regular basis during a working day.

39 **Use selection sets layers** How many times have you selected a series of objects and then accidently clicked away? No worries, simply undo, right? Okay, how many times have you had to go back and make the exact same selection again half an hour later or maybe a day or two later? To overcome this simple but annoying matter, we can use Quick Select Sets (Create>Sets). Usually, when I skin a character, I select all the joints and pop them into a Quick Select Set. That way, if I need to skin a different character with the same skeleton, I can do so easily and then transfer the skin weights in a jiffy. Once you have a Quick Select Set created, you can also drag and drop extra objects/nodes into the set in the Outliner.

40 **Use the Measure tool** If you are aiming to create photorealistic results, it is advisable to work to scale. Energy-conserving materials, lights and so on all work best when doing so. To help you check the size of your assets, try using the Distance tool in Maya, which you will find under Create>Measure Tools.

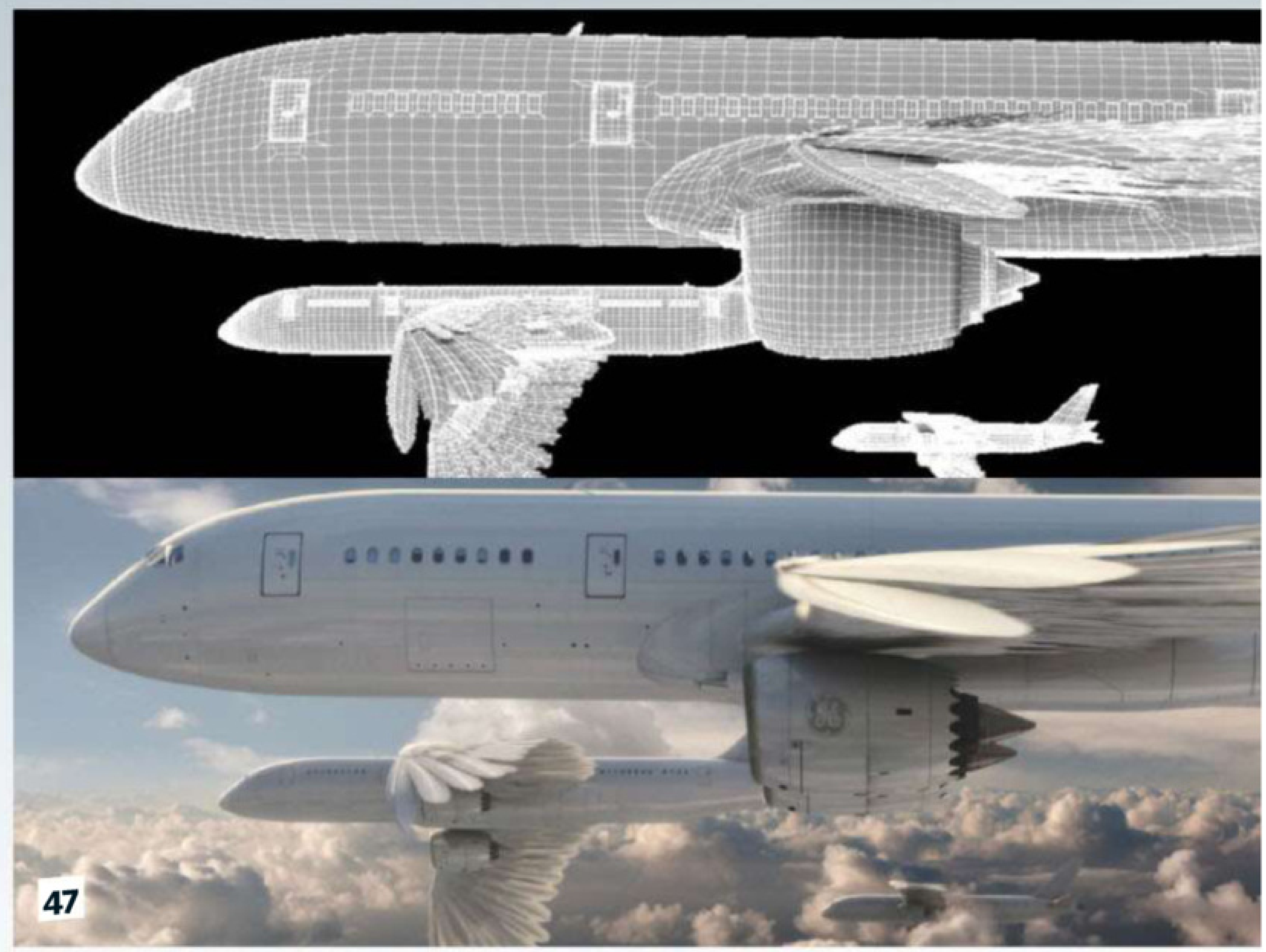
From the studios

THE EXPERTS

ANDRES EGUIGUREN
www.themill.com
3D supervisor at The Mill's New York studio with more than 20 years' expertise in visual effects

BENJAMIN WALSH
www.methodstudios.com
Senior creative director at Method Studios LA

CHRIS BACH
www.psyop.tv/
Head of CG at Psyop NY. His work as technical director over the years has significantly impacted on many of the studio's award winning productions, like LG's 'Something's Lurking', Adidas's 'Hu Jia' and Converse's 'My Drive Thru'


47

41 **Get all the info** As a CG artist, it's not uncommon to get assigned a task and not know how it will be used in the final commercial. That basic knowledge is key and will help you manage your time correctly. You must understand the shot to focus on the assets and textures that will be featured, instead of ones that will be out of focus and in the background.

42 **Make friends and explore different workflows** Instead of killing yourself trying to do something the 'right' way, talk to people around you. They might have a better way to get to a solution that is faster and still looks great.

There is no right and wrong in CG. Get creative. Just because a client mentioned liquids, does not mean that fluid simulations are necessarily required.

43 **Learn how things are done outside the CG world** CG artists tend to live inside the computer, but you should gain an insight into the shooting and production process. You can understand, for instance, why a 300ft by 100ft green screen is simply not a good idea. A green screen like that would fly away at the slightest breeze and would be a hazard, not to mention the cost of putting it up, bringing it down, insurance and so on. Being aware of other people's obstacles will help you to assess and decide what the better, cost-efficient option will be.

44 **Building CG before the shoot** We often ask for the editor to be on set to make selects on set of hero VFX plates so we can start tracking, roto and clean-up before even receiving the locked edit. This involves strong communication between the production company, agency and editorial so that everyone is aware of the importance of VFX needing the plates.

> *JUST BECAUSE A CLIENT MENTIONED LIQUIDS, DOES NOT MEAN THAT FLUID SIMULATIONS ARE NECESSARILY REQUIRED*
>
> **ANDRES EGUIGUREN**
> WWW.THEMILL.COM

44

45 **Don't over-promise** It's important to have the CG concepts locked prior to starting production as opposed to designing on the fly. When occasions arise that need last-minute redesign, you have to know your limitations on what is possible in the timeframe. Tell the client if they want it to look amazing, then there are boundaries.

46 **Model the details** Another general rule is if there is a slight chance that a CG model will be closer to camera than originally anticipated, then assume it will be twice as close. Model the additional details, create the refined textures and spend time on the lighting look-dev. If possible, get the environment (this could be a photo from set) as early as possible to start your look-dev in, instead of working in an arbitrary lighting setup.

47 **Recycle assets whenever possible** The GE spot above is a good example of this. The feathers used on the winged plane came off a bird created on a feature project and were then changed in colour and layout. For each tree, procedural branches and leaves were grown from the base trunk using Houdini.

48 **Keep organised and delegate tasks** Don't let any one artist, even yourself, horde all the cool parts of a project. The workload will be too high. These seem like obvious things, but are often ignored and can cause a project to fail.

49 **Work in broad strokes first, then refine** Putting time into a solid previs can save a lot of time in every other phase of production. If you're able to build upon that pre-vis, refine it as you move along so you can avoid over-modelling and animating details that will never be seen. Start with simple rigs and add control as needed.

50 **Work in parallel** Build rigs with proxy, proportioned geometry and move into animation quickly. Animate while modelling to continue refining details. Start shading assets within progress geometry and do a rough pass of scene lighting with stand-in assets. When shots approach a reasonable level of completion, render every tenth frame, or a five-frame sequence, to get notes and requests from compositors back as early as possible. Every stage of production should overlap with the previous and subsequent stages.

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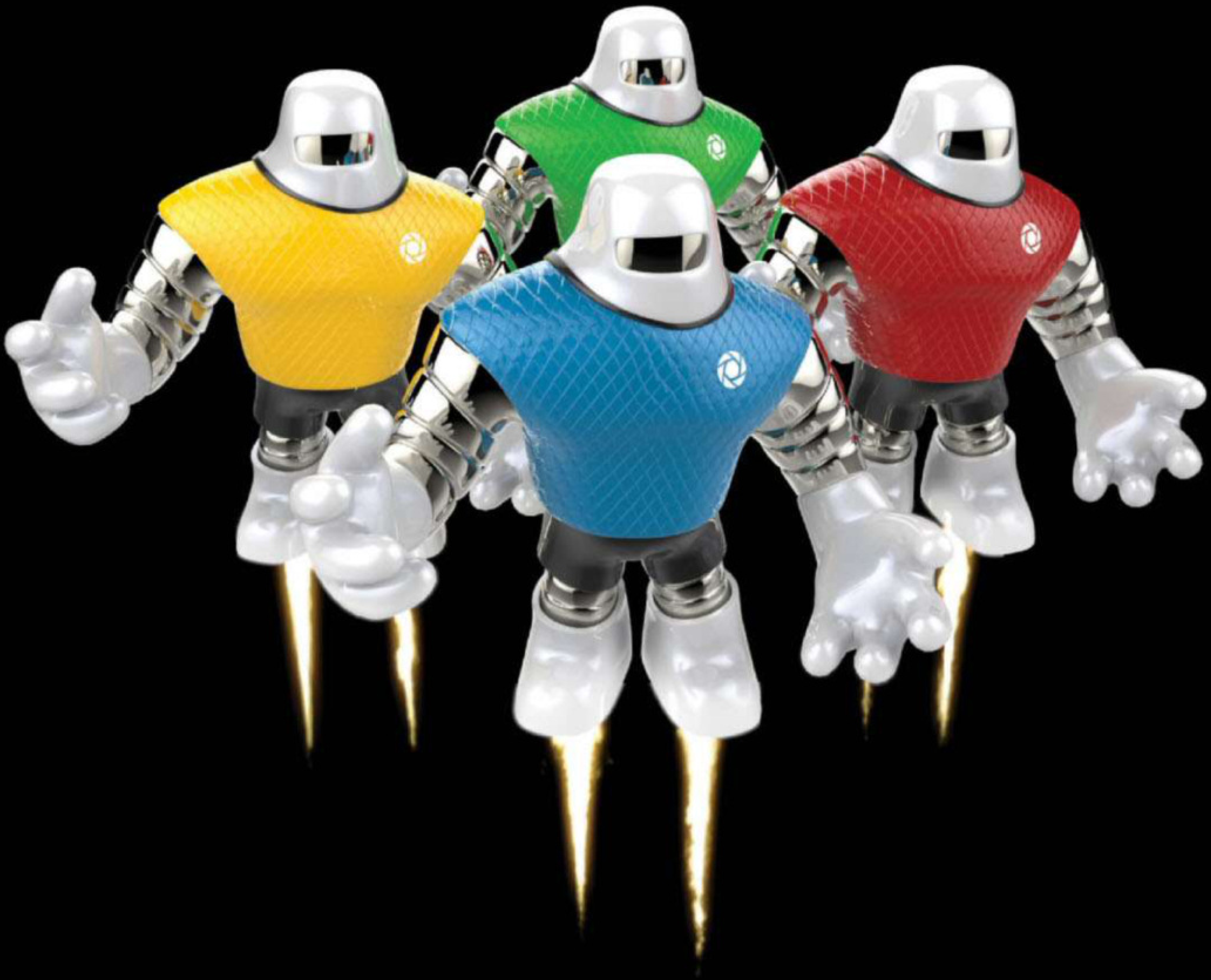

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Model by Steve Talkowski
http://sketchbot.tv

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ANATOMY FORM & FUNCTION

We talk to four of the most talented digital sculptors working today about mastering the complex structures that exist beneath the skin

It's not every day that a lead artist advises you to invest in a full human skeleton, adding that, nowadays, you can probably find them for a relatively cheap price. When we interview Tian Cocker, however, he tells us that these are exactly the kind of tools that any artist serious about creating a beautiful, anatomically accurate character needs.

"I haven't got a real skull though! I've got a resin plastic one," the lead artist at RealtimeUK laughs, explaining that he received the skull from Scott Eaton after having taken part in his facial reconstruction course. "When I was at Disney they used to get people in to teach us, and one of them was Scott Eaton. He taught us for around a week," remembers Cocker. "There's only a few artists I know of in the world like him, who work in ZBrush and really understand anatomy, and their work is amazing. It was his course that really got me into anatomy and opened my mind to studying it in more detail."

It's easy to see why studying anatomy would be important enough for Disney to take notice. In the past, Italian Renaissance artists such as Leonardo Da Vinci and Michelangelo improved their work by refining a more lifelike portrayal of the human figure – a process that involved anatomical dissections and even skinning human bodies to discover what muscles lay underneath. For years, these studies would be more sophisticated than even the anatomical knowledge taught by the universities at the time, and ultimately, they worked.

A better understanding of how each muscle in the human body functioned allowed artists like Da Vinci and Michelangelo to create pioneering work, work that is considered some of the greatest ever created, even to this day. For 3D artists, there are now centuries of knowledge that can be taken advantage of. We interviewed some of the most talented 3D modellers developing 3D anatomy today – Scott Eaton, Tian Cocker, Ryan Kingslien and Dan Crossland – to learn how.

EXPERTS

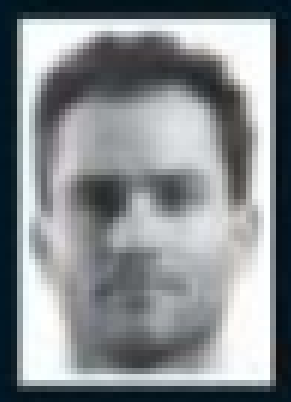
SCOTT EATON
www.scott-eaton.com
Scott's designs have been featured in *Wired* magazine, *Vogue, Vanity Fair, The Times, The Telegraph,* and can be found in Harrods and other design shops around the world. Entertainment clients include Pixar, Industrial Light & Magic, Disney, LucasFilm, Valve, Sony, Microsoft Game Studios, Electronic Arts, Ubisoft, and many other studios

TIAN COCKER
www.tiancocker.com
3D artist specialising in digital sculpture, inspired by classical sculpture and art, anatomy and the human form. Currently working as lead artist at RealtimeUK

DAN CROSSLAND
www.dancrosslandart.com
In 2005, Dan moved into the games industry where he worked on nine successfully published titles across all platforms including several AAA games. In 2010 he became a freelance artist producing CG sculptures, model work, concept artwork, textures and visual effects for TVCs, feature films and games, and now works as senior character artist at Ninja Theory.

RYAN KINGSLIEN
www.ryankingslien.com
In 2004 Ryan became the first product manager for ZBrush at Pixologic where he worked with programmers and artists to fuse traditional and digital art processes. Today, he is busy teaching the world to sculpt through his company YouSculpt LLC and its training sites **www.zbrushworkshops.com** and **www.gameartsinstitute.com**

Anatomy: Form & Function



SCOTT EATON

CAN YOU TELL US ABOUT WHAT YOU'VE BEEN WORKING ON SINCE YOUR **3D ARTIST** COVER AND FEATURE IN ISSUE 54?

Looking back, it has been a busy year! One of the more monumental projects from last year was working on a 13-foot tall naked Lady Gaga with Jeff Koons. After a bunch of tight deadlines, it culminated in the huge Gaga being installed in NYC for ArtRave – the launch party of Lady Gaga's latest album. Around that time, I also launched my Portraiture & Facial Anatomy course online. I have been running the course in my studio for almost four years now and it was past time to get it online.

In the New Year we also launched our Megafaces project at the Sochi Olympics. This project was by London architects Asif Khan Ltd, Swiss engineering firm iArt, and with art direction by me. After a painful week of debugging and hardware problems leading up to the games, the installation ran beautifully for the duration of the Olympics and Paralympics. It recently won the Grand Prix for Innovation at the Cannes Lions Festival of Creativity.

Since then I have been working with Lalique, a French crystal company, on a couple of designs in crystal. As far as anatomy and character design work goes, I've been helping the team at Guerrilla Games in Amsterdam on some upcoming projects.

WE KNOW THAT FOR YOU, THE BEST APPROACH TO ANATOMICALLY-CORRECT SCULPTING IS TO LEARN FROM THE GREAT MASTERS OF THE PAST. HOW WOULD YOU ADVISE ARTISTS GO ABOUT THIS?

Learning artistic anatomy is a two-fold process – the first part is learning the construction of the body: studying the skeleton, landmarks, origins, insertions and actions of the muscles. The second, more artistic part, is learning the forms that the anatomy makes – the shapes, volumes, contours, and planes. Doctors are really great at the first, but for the most part they couldn't draw or sculpt a body to save their jobs.

The thing to always watch out for when you are drawing or sketching is to really try to understand what it is that is creating the forms you are observing. This is why écorché drawing is so useful for learning both aspects of anatomy – you observe the forms as they appear on the surface and build up your visual understanding, and then you exercise the more analytic side of the brain trying to figure out what anatomy is creating the form and why. It feeds both sides of the learning process.

WHAT IF AN ARTIST NEEDS TO CREATE A DIGITAL SCULPT USING ONLY THE POWER OF THEIR IMAGINATION?

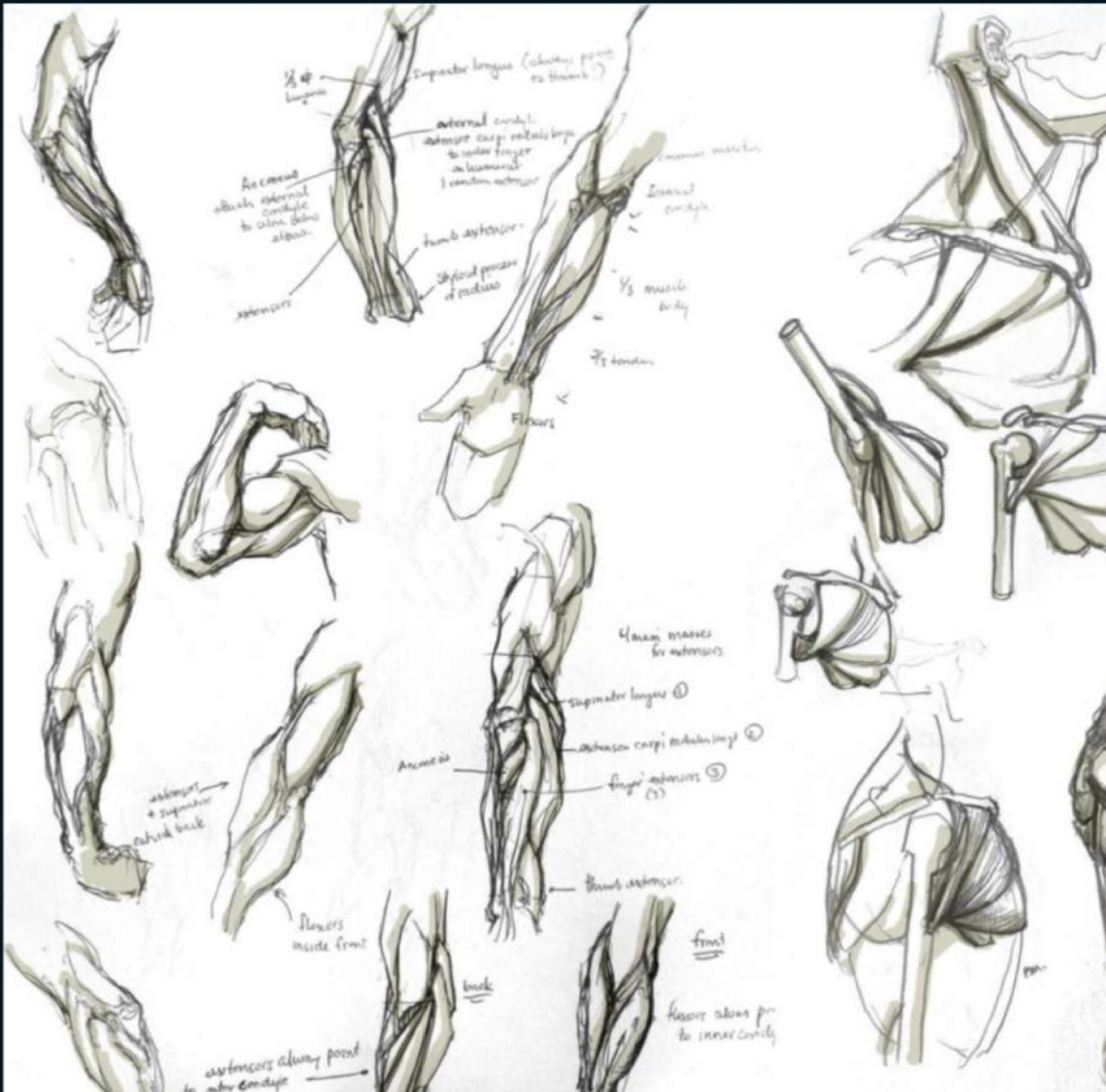
This is exactly why we study anatomy – not to copy, but to be able to invent. Once you have internalised the principles of anatomy, and really understand the mechanics and construction of the body, you can use those same principles to create imaginative poses, humans, or creatures just from constructional principles.

Remember that using anatomy as an artist doesn't have to equate with realism. Egon Schiele is a great example. He studied at the Academy of Fine Arts in Vienna and was subjected to rigorous drawing and anatomy training, but later he evolved a very expressionistic style. You can see his complete works at **www.egon-schiele.net**.

WHAT ARE THE TOP TOOLS IN ZBRUSH YOU WOULD ADVISE USING WHEN CREATING ANATOMICAL SCULPTS IN 3D?

In general, topology is now very flexible in ZBrush. With the remeshing and projection tools, the artist can really just work on whatever topology they are comfortable sculpting on, and then retopologise later, as necessary. I don't worry too much about topology for these reasons, but I do use the Transpose tools frequently, so decent edge looping often comes in handy. Beyond this, my toolset for sculpting is very basic; just a handful of brushes, nothing custom. I can quite happily sculpt for an entire day using just Standard, Move, Clay Tubes and Transpose brushes.

Eaton's Hercules XIII tablet stand was named one of the top 10 designs at LDF by *The Times*



> THIS IS EXACTLY WHY WE STUDY ANATOMY – NOT TO COPY, BUT TO BE ABLE TO INVENT
> **SCOTT EATON**

"I created my anatomy courses to cover the critical aspects of anatomy that, in my opinion, every figurative artist needs to know," explains Eaton. "It is very important to learn the surface forms of anatomy"

FIVE BOOKS FOR LEARNING ANATOMY

HUMAN ANATOMY FOR ARTISTS: THE ELEMENTS OF FORM

Eliot Goldfinger

Sculptor and instructor of human and animal anatomy, Eliot Goldfinger, sets out detailed information on each part of the human anatomy from head to feet.

ANATOMY FOR THE ARTIST

Sarah Simblet

Artist and academic Sarah Simblet reveals the construction of the human body through photographs of male and female models, historical and contemporary works of art, her own illustrations and even selected drawings superimposed over photographs.

ARTISTIC ANATOMY

Dr. Paul Richer

Originally published in 1889, *Artistic Anatomy* has reportedly been used as a resource by Renoir, Braque, Degas and many others.

ATLAS OF HUMAN ANATOMY FOR THE ARTIST

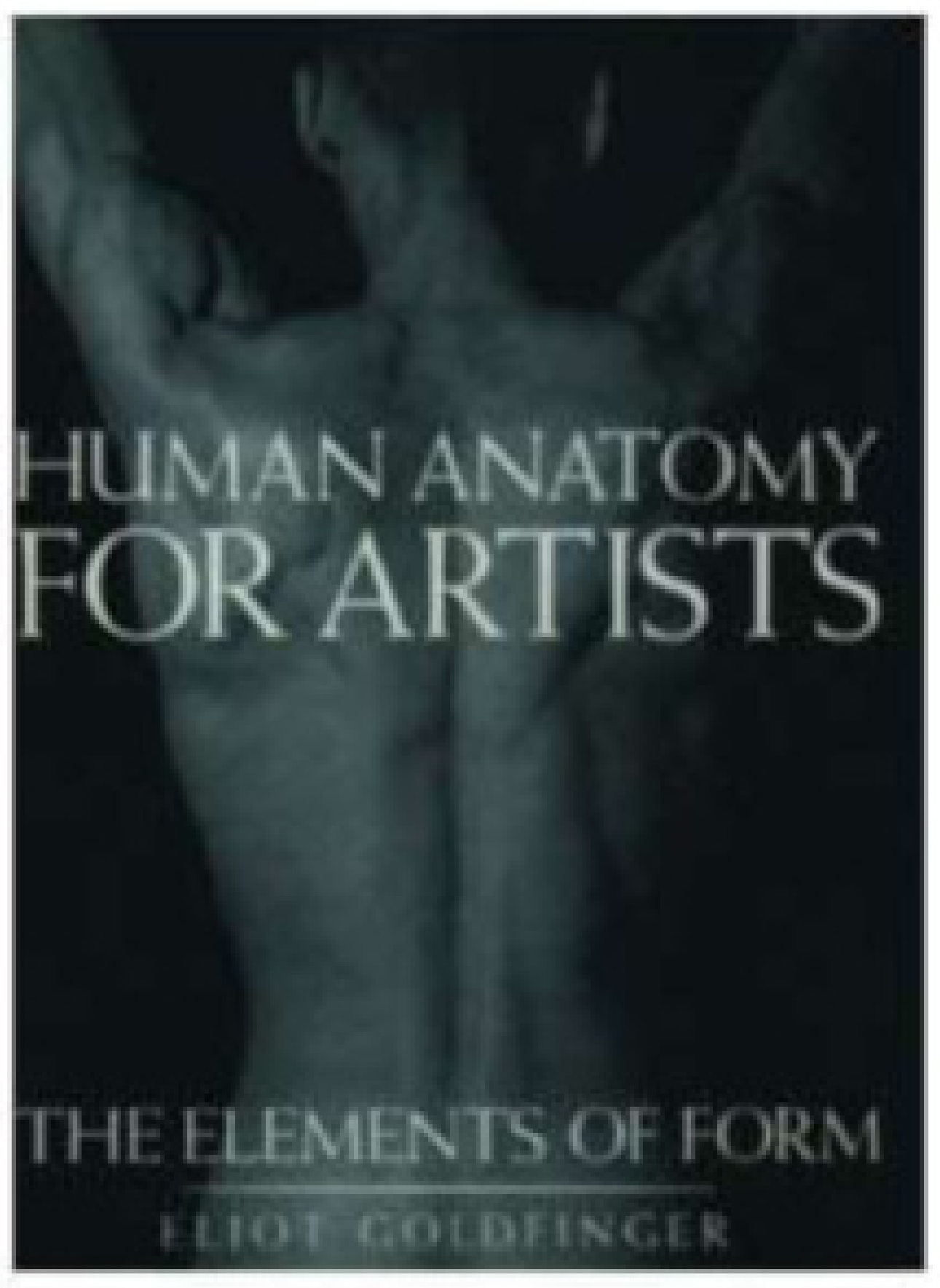
Stephen Rogers Peck

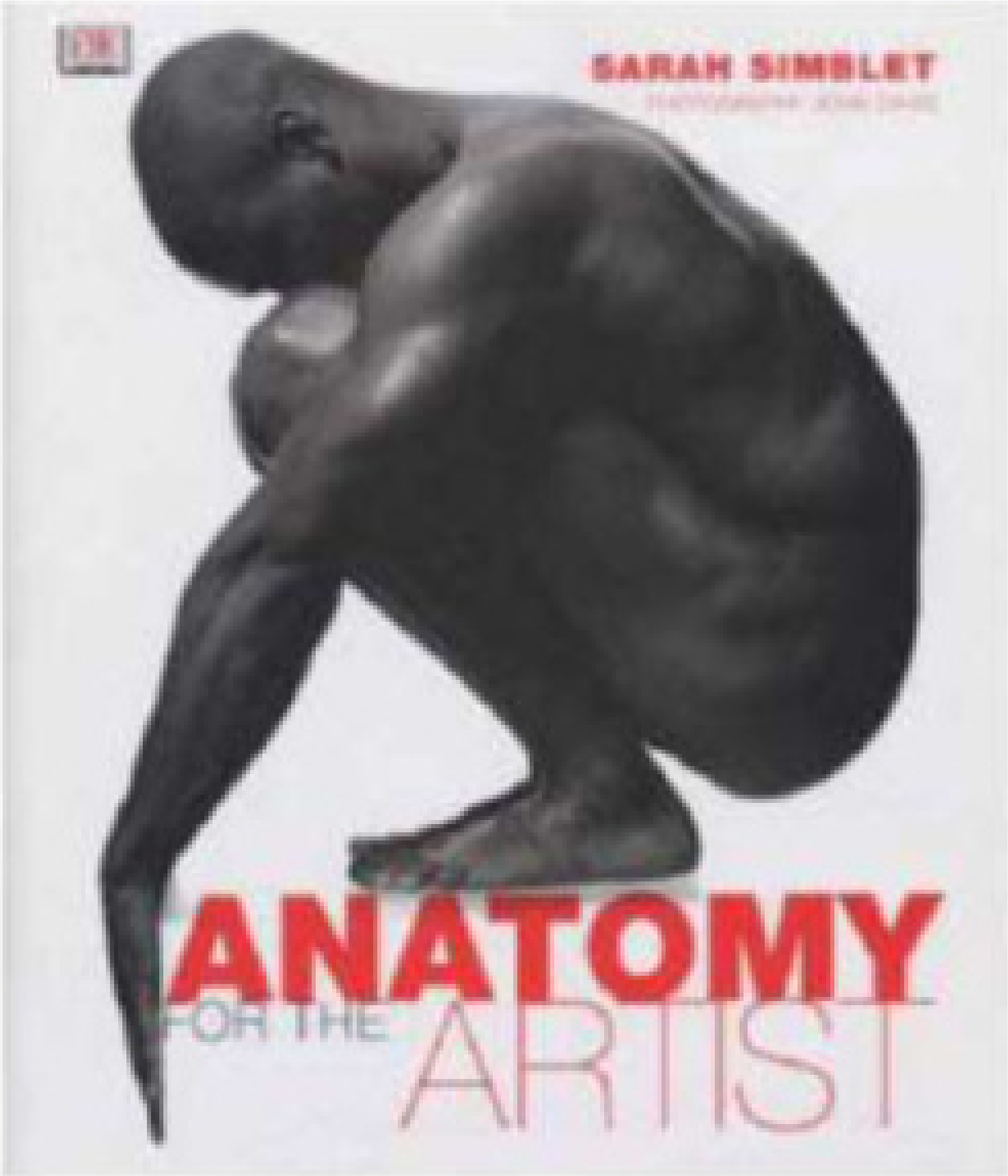
Includes sections on bones, muscles, proportion, equilibrium, and locomotion among sections on the types of human physique and anatomy from birth to old age, as well as race.

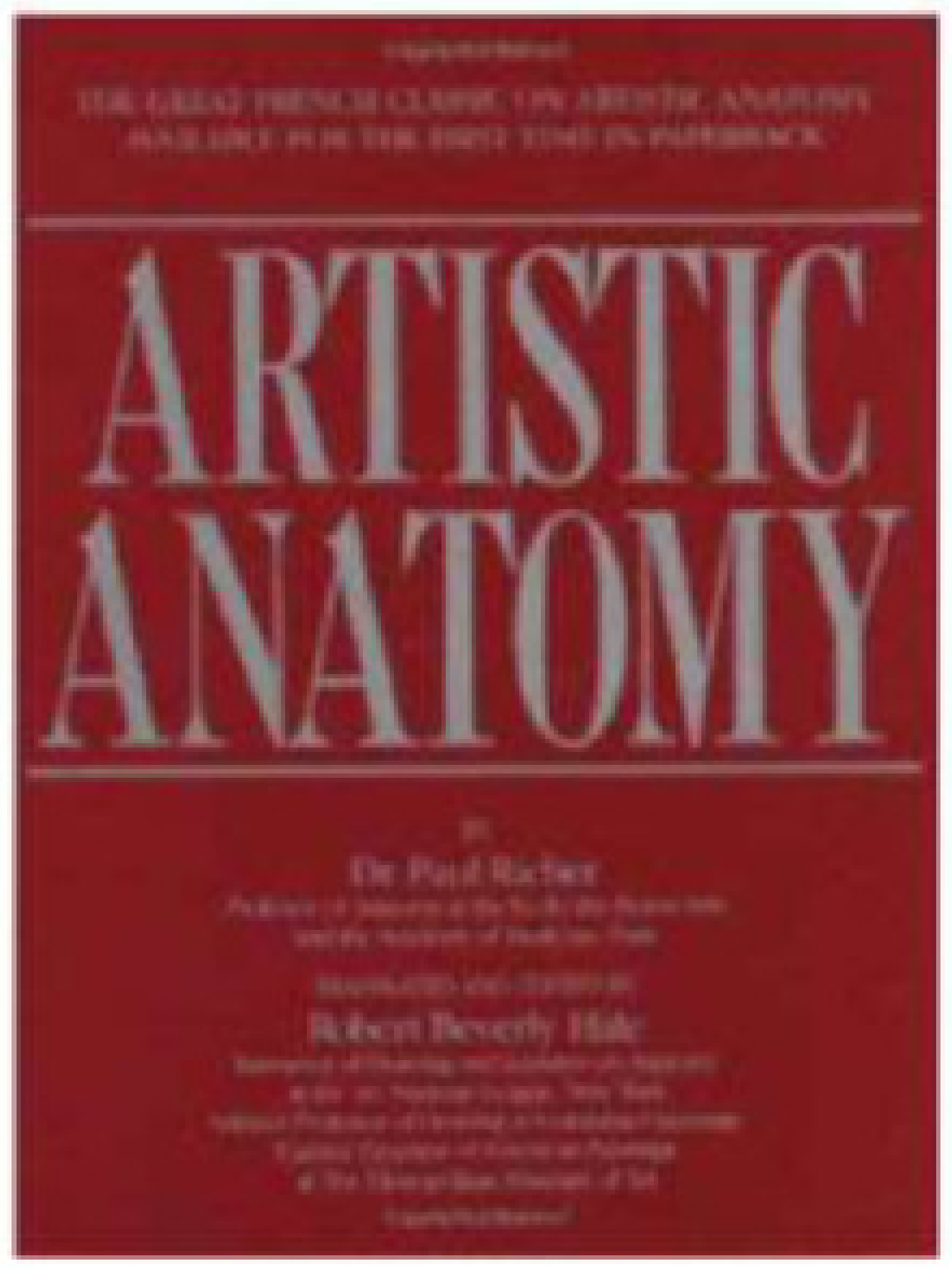
MODELLING AND SCULPTING THE HUMAN FIGURE

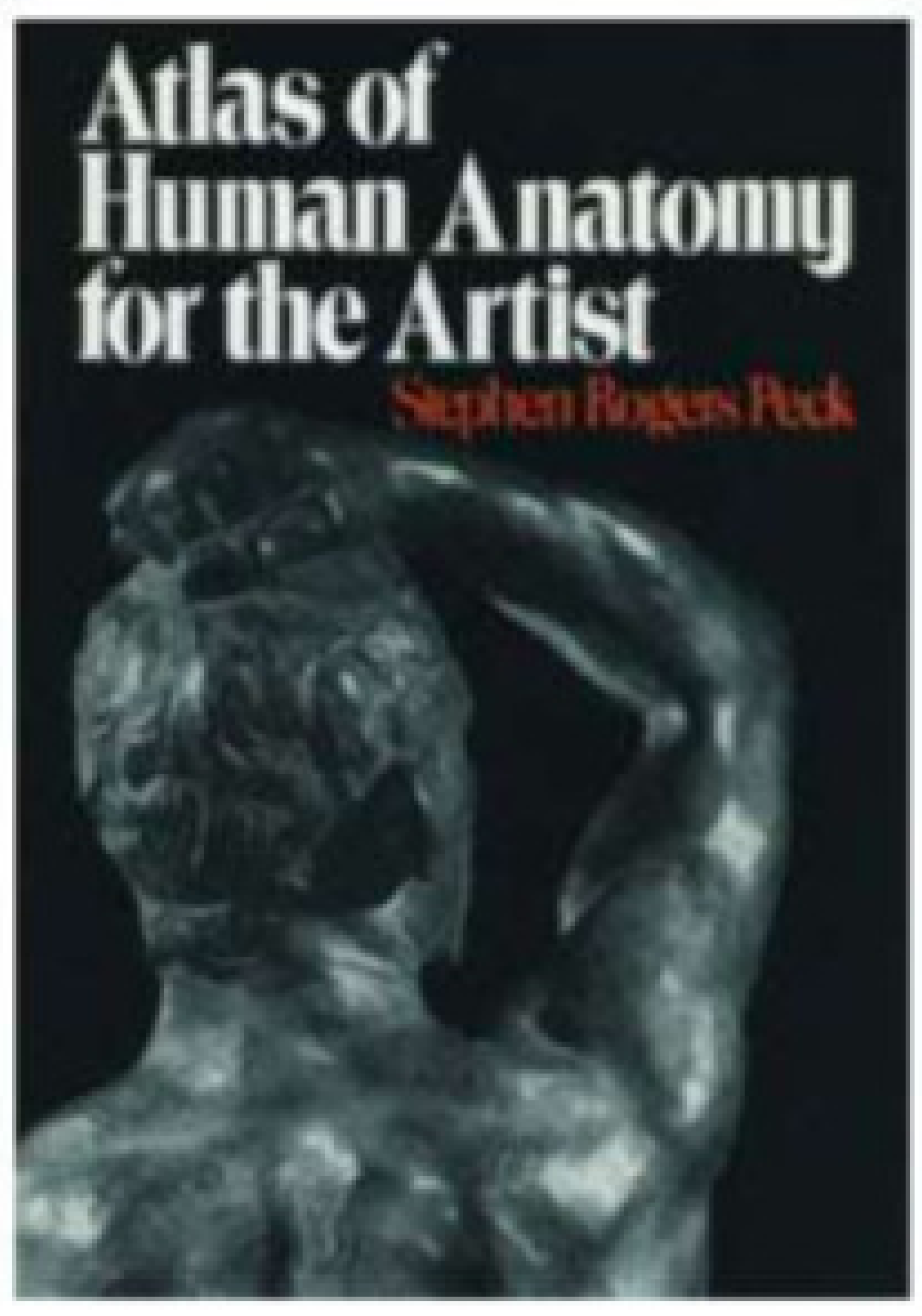
Edouard Lanteri

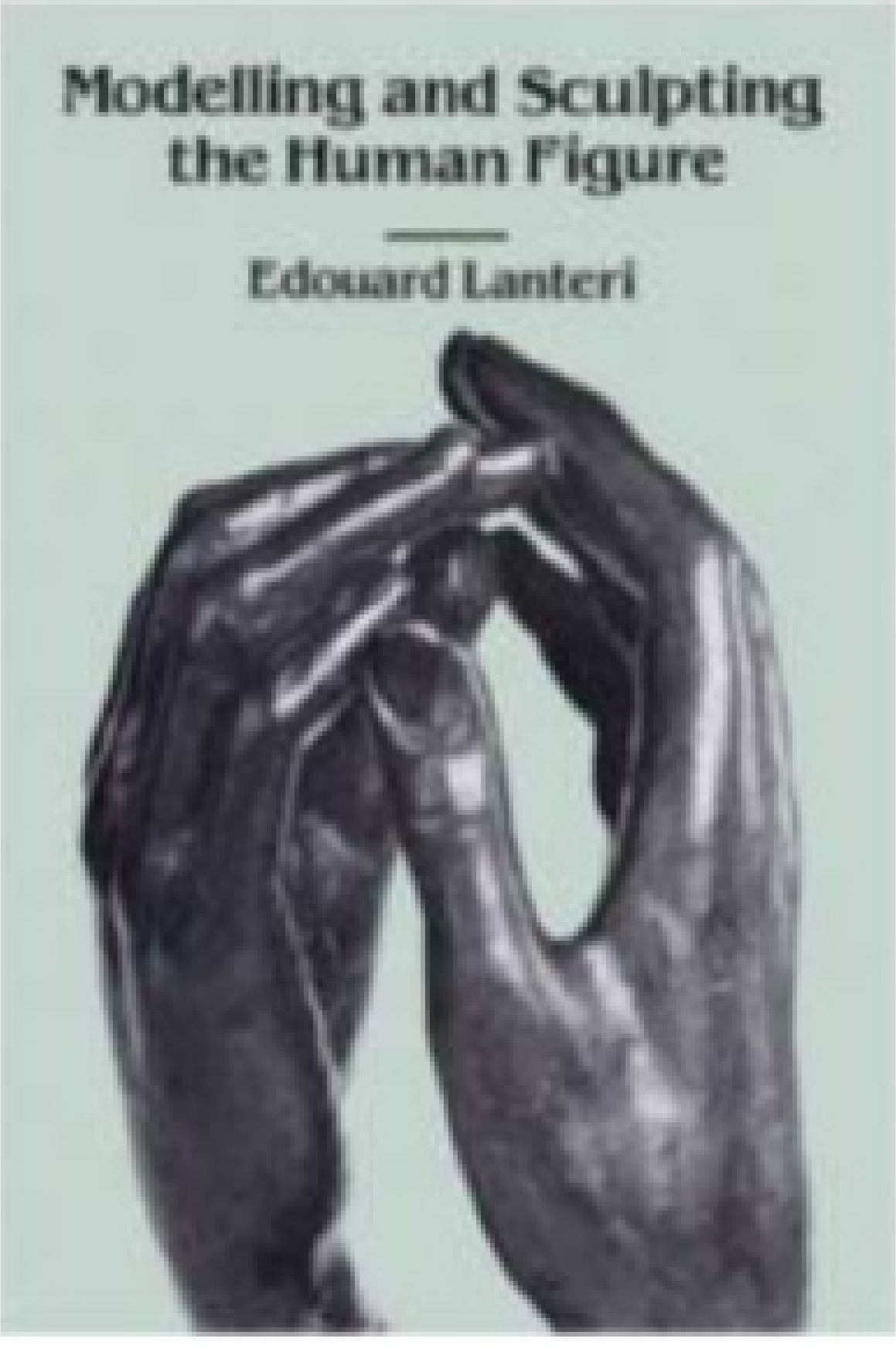
Lanteri covers modelling from casts to live models as well as elements such as proportions, drapery, and adding inscriptions to traditional sculpts





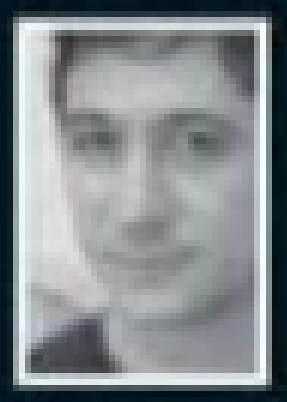






"It's not just knowing the names of the muscles, but knowing their attributes: knowing what bone they're attached to, where they originate, where they insert and so on," says Cocker

Eva Green with a G36 by Tian Cocker, who sculpted the piece in ZBrush, rigged and posed it in Maya, retopologised in 3DCoat, textured using ZBrush and Photoshop, and finally rendered using mental ray



TIAN COCKER

HOW DID YOU GET INTO THE STUDY OF ANATOMY?

Well, originally years and years ago I studied zoology – I was always interested in science and nature and graduated years ago, but there was nothing I really wanted to do in terms of work because it was all too sterile and I needed something creative. When I went back over to art, I suppose that science background and that interest in animals and physiology developed into my interest in anatomy.

I think a lot of people who are purely artists who have gone to art school and studied fine art probably haven't really studied anatomy or been exposed to the scientific side of it. I see a lot of CG character stuff, and obviously it's some great stuff, but if you look at the anatomy, sometimes it's pretty wrong. I was teaching anatomy for character artists at a university, and I think my students expected just to be able to start sculpting straight away, but it is a lot of hard work at first. It's hours and hours of research and reading and it can get quite dull and boring. To learn, I basically took a few anatomy books and just read them from cover to cover a few times, took hundreds of notes and learned a few basics. I just drilled it into my head!

WE LOVE HOW MUCH ENERGY AND STRENGTH YOUR SCULPTS SUCH AS AURELIE DUPONT *AND* DIANA VISHNEVA *CONTAIN – HOW CHALLENGING WAS IT TO DEVELOP THE EXTREME POSES OF A DANCER?*

For posing something like a ballerina it was really difficult. I wanted to do something to really challenge myself and my own knowledge; something that involved really pushing the human figure to its extremes.

All of it is about understanding. If you're going to pose the neck you have to know which muscles turn the neck to the right. Same with the arms or the legs, so knowing what muscles are involved with lifting the legs or the thighs means you can rely more on your knowledge on mechanics instead of just photographic materials to get a sculpt done.

WHAT LESSONS HAVE YOU LEARNED FROM SCULPTING ANATOMY THAT YOU WOULD ADVISE TO OTHERS?

For me it's just keep the brushes simple. There are a lot of people who use hundreds of brushes, but although I have got hundreds of brushes installed in ZBrush, when I'm sculpting a character I probably use four, maybe five. Most of the time, I start from a DynaMesh very roughly shaped, blocked out in Maya or something, and just start sculpting into it. I like taking DynaMesh stuff and not even really knowing where I'm going to go with it – just using the Clay Tubes brush or Clay Build Up and really going in there quite aggressively, laying out stuff. I think for me a massive inspiration is looking back at the old masters like Leonardo, and just copying their drawings or even sculptures. You really start to see details that you wouldn't normally notice if you casually go into a museum and just browse.

Also, proportion can be a real pain! It's not so bad if you're just making a character in a T-pose, but when you're really posing stuff in a more extreme pose, that's when proportion becomes a real problem. There are lots of ways you can resolve this, but mostly I use head lengths or half-head lengths to break down the proportions of the body. For my sculpts in ZBrush I actually sometimes even measure things with a ruler! Alternatively, you can just use the Transpose tool and calibrate it to the measurements needed.

WHAT ANATOMY WORK WOULD YOU IDEALLY HAVE PRODUCED IN FIVE YEARS TIME?

What I'm trying to head towards in my personal work is stuff that is looser and a bit more immediate and natural. I think Scott Eaton has mastered that – his stuff is great. That's where I'd like to go, and I don't want to emulate or copy Scott's stuff at all, but definitely create a kind of looser, organic feel.

TRADITIONAL SCULPTING VERSUS ZBRUSH

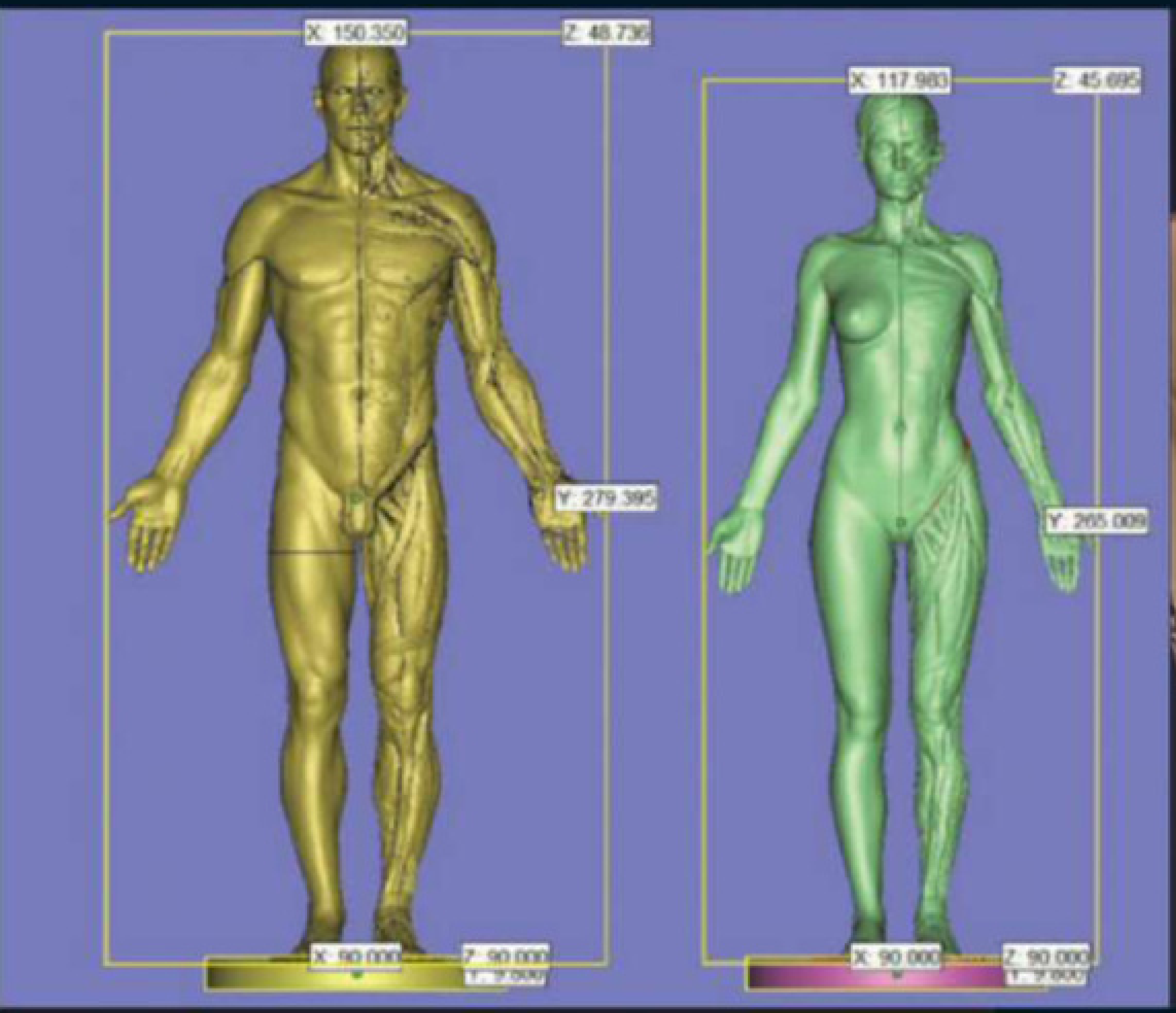
WHAT DO YOU FEEL ARE THE ADVANTAGES OR DISADVANTAGES FOR A TRADITIONAL SCULPTOR WHEN LEARNING TO USE ZBRUSH AND 3D?

TIAN COCKER
Clay is messy, it's time-consuming to set up and eventually you might want to make it into a bronze piece, but that's very expensive. With ZBrush, at the moment all you need is a fairly cheap computer, a Wacom, and some time. You don't really need a big studio with lots of space, it's not messy, and you can delete things or quickly undo mistakes. Maybe when I've retired I'll take up clay in my own studio!

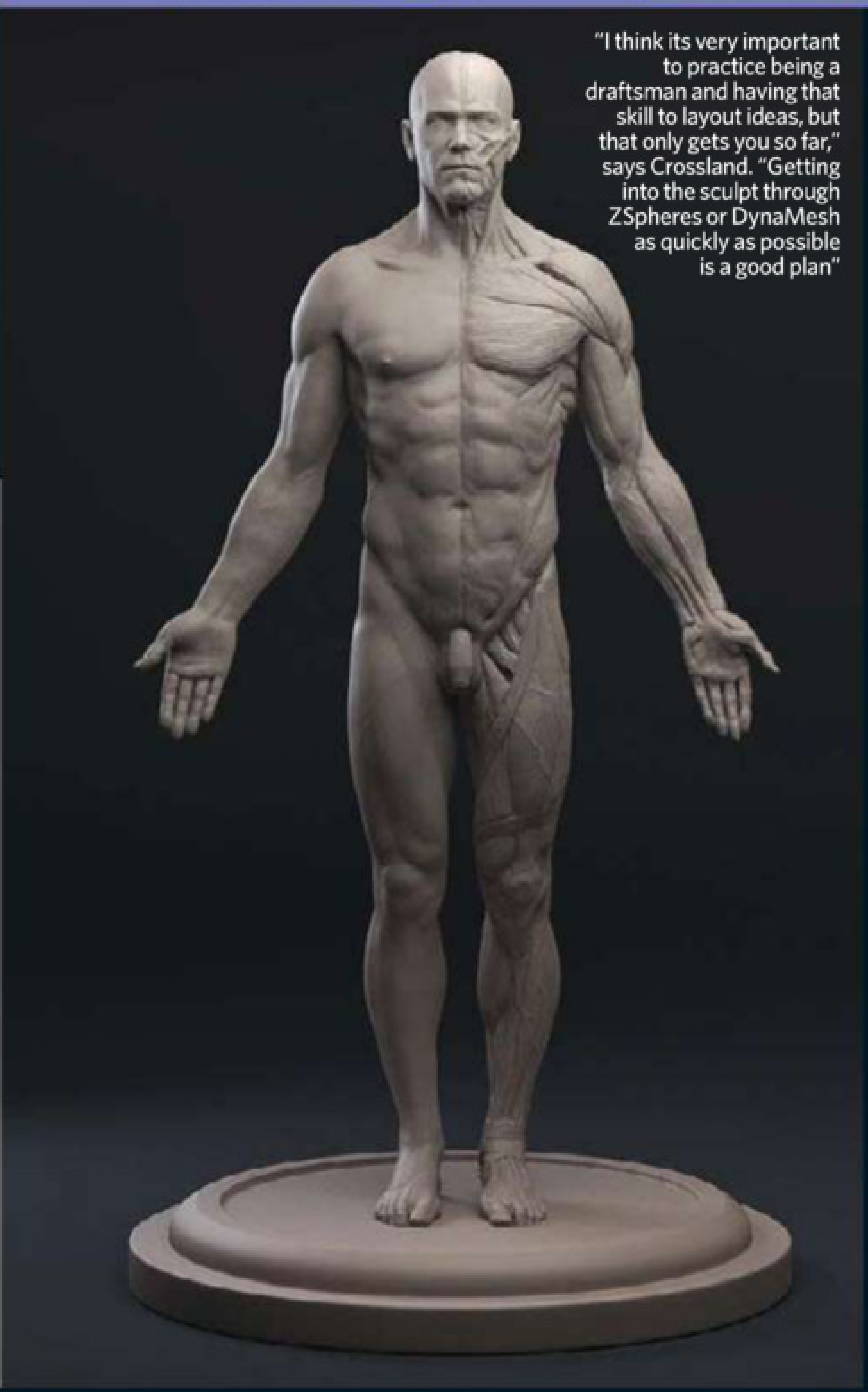
SCOTT EATON
ZBrush is a great tool for experimenting and exploring form. It is very forgiving, much more so than clay, so you can test ideas, and fail a lot! Still, clay still wins on responsiveness, three-dimensionality – yes, it is the real 3D – and tactility. There is a level of expression that can be achieved quickly in clay that is still hard to elicit from the computer. Some of my current pieces are exploring using a combination of ZBrush, fabrication, and clay. We'll have to wait and see how they turn out.

I THINK THE FUTURE IS VERY EXCITING FOR 3D SCULPTING: I SEE IT GETTING BETTER AND BETTER OVER TIME

DAN CROSSLAND



Crossland worked with 3DTotal to bring artists an affordable anatomy figure, giving birth to a project on Kickstarter where artists pledged £24,662 of a £1,500 goal



"I think its very important to practice being a draftsman and having that skill to layout ideas, but that only gets you so far," says Crossland. "Getting into the sculpt through ZSpheres or DynaMesh as quickly as possible is a good plan"

DAN CROSSLAND

CONGRATULATIONS ON THE SUCCESSFUL KICKSTARTER CAMPAIGNS FOR BOTH YOUR ANATOMICAL COLLECTION MODELS. CAN YOU TELL US MORE ABOUT WHAT GOT YOU INTERESTED IN CREATING THE MODELS AND EMBARKING ON THE PROJECT?

I think the main reason I wanted to create the figures is for the challenge. Figurative artists through the ages saw anatomy – whether it was sculpting or drawing – as the essence of their training and understanding. Since I am a character artist for a living, focusing on and improving my own skills while creating something of merit is both challenging and fulfilling when you have a physical creation at the end of it.

FOR ARTISTS WHO HAVE BOUGHT, OR ARE INTERESTED IN BUYING THE MODELS, HOW WOULD YOU ADVISE THEM TO USE ONE TO IMPROVE THEIR DEPICTIONS OF ANATOMY?

I think just spend some time looking at the figure. There are so many tricky elements in anatomy, so it's really nice to just turn the model and it's there to see and advise on what you should sculpt. Also, get the figure under a spotlight if you have one on your desk – it reveals so much more information that can help improve your work.

WHAT WAS THE WORKFLOW FOR CREATING AN ANATOMICALLY CORRECT MODEL TO SCALE?

I started by just modelling a male form to the best of my ability with the right amounts of vascularity. I wasn't thinking about scale or anything other than creating a male figure with the same sensibilities as you see in old master sculpts, focusing solely on shapes and the weight of the statue and making it natural and relaxed while revealing the muscle groups in a realistic way. I think 70 per cent of my time was spent working on this stage.

Once I was happy, I duplicated the entire figure and worked on a separate figure, plotting all the muscle groups out for the écorché side, so essentially there are two complete figures – one with all the skin off and one with the skin on. I like to work on a full figure for reasons of balance, while working symmetrically it is easier to go in and start adding all of the details accurately. The two figures were finally combined by using a series of projections and topology changes to hold the details using ZRemesher.

ARE THERE ANY COMMON MISTAKES YOU FEEL 3D ARTISTS CAN OFTEN MAKE WITH ANATOMY?

If you follow the canons of anatomy from the ages, I feel some of the proportions, while correct, aren't suitable for some characters, especially in a game environment where your camera perspective is going to amplify proportions. That's why I see – even in AAA games – characters with super-short legs or small feet, for example, and this makes it feel awkward. Follow the rules, but bend them if it will mean that you make something more aesthetically pleasing in the end.

HOW DO YOU ENSURE CLOTHES AND HAIR DON'T DISTRACT FROM THE ANATOMY OF YOUR MODELS?

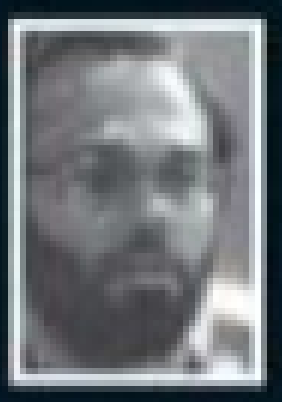
A general rule is to concentrate 100 per cent on the anatomy. The design of hair and clothes can be worked on and concepted over the anatomy and made at a different stage. When posed, the clothing should balance the character and enable the eye to wander freely over and eventually end at the areas of interest. I try to create interesting shapes in the negative spaces that help me to do that.

WHAT KIND OF PROJECTS WOULD YOU BE EXCITED TO WORK ON IN THE FUTURE?

I want to focus more on 3D printing and producing more figures in the future. I have some really interesting ideas to push things a little further and explore the area to its full potential given the tech we have at the moment.

I think the future is very exciting for 3D sculpting; I see it getting better and better. Using real-time shaders, I think the actual interface and environment will continue to improve, and there's been so many exciting features implemented into ZBrush that I look forward to the next iteration.

Anatomy: Form & Function



RYAN KINGSLIEN

YOU'RE CONSIDERED ONE OF THE MOST RESPECTED ZBRUSH TUTORS IN THE WORLD TODAY. HOW DID YOU FIND YOURSELF WORKING FOR A COMPANY LIKE PIXOLOGIC?

It might sound odd, but it all started over 20 years ago when I was sitting on my back porch in the Avenue district of Ventura, California. The Sun was setting and a thought hit me with the clarity of day break: Leonardo Da Vinci would be using the computer if he was alive today.

Even then, I knew that the computer was not the end all of artistic creation. It's just a tool. You still need the same knowledge, the same skills that any artist working today or in the past needs: anatomy, form, proportion, story. That day I designed the plan I'm basically living today: go to traditional art school (PAFA), then get a BA in creative writing (Antioch) then learn the digital tools (Gnomon) and then create a school and teach this new art form. What I didn't plan for was Ofer Alon and ZBrush.

Ofer was an amazing person to work with and ZBrush really lead the transition from software tools being engineering focused to being artist focused. His vision of what software could do led to me staying with them for several years and eventually starting my new school focused entirely around ZBrush software.

HOW IMPORTANT IS IT FOR A 3D ARTIST TO LEARN ABOUT ANATOMY?

I don't think it's crucial for 3D artists to know anatomy, per se. I do think, though, that there is a direct relationship between your understanding of anatomy, your understanding of traditional forms of knowledge and your pay check. The more you know, the faster you work and the more consistent your results are. You are then in a position to request more salary or hire freelance fees or just do more work.

CAN YOU TELL US MORE ABOUT YOUR EXPERIENCES TEACHING ANATOMY, SUCH AS WITH ANATOMY R4 AND UARTSY?

Artistic anatomy is intimidating. The most important thing to learn is that you are not alone and that the problem is not you. Also, it's not a fast process. It's like learning a new language. I tell students to focus on the system and do the work one day at a time. In a few short weeks, your brain will update itself with all this new knowledge and you'll barely notice. You'll just be sculpting better.

WHAT ARE YOUR TOP FIVE TIPS FOR SCULPTING CORRECT ANATOMY?

First, when you get lost, redraw. If you don't understand the anatomy of a place then stop what you're doing and redraw the muscles. Get your head around them and then move on.

Second, focus on the joints. Everyone can sculpt a bicep – that's easy – but can you sculpt the medial epicondyle as it connects with the medial head of the tricep and the flexor group of the forearm? Joints are absolutely essential! If the only anatomy you put into your piece is the elbow and knee then you're already ahead.

Third, remember your hierarchy of form. The cylinder of the bicep is irrelevant next to the cylinder of the upper arm. Always sculpt the general words first before you start using your anatomy words. Chest before pectoralis. The upper leg before the rectus femoris.

Fourth, when you don't know what to do next, increase your vocabulary. Often we reach a plateau in our work and don't know what we need to do next. To fix this, we just need to develop our inner critic a bit more. Give it more words to look for. For example, don't know what else to do to make your portraits better? Well, find the infraorbital margin. If you already know that then find where the obicularis oculi inserts into the bone or look for where the levator labii superious inserts.

Fifth, you are not superman. Go easy on yourself! You've got this.

> THE SUN WAS SETTING AND A THOUGHT HIT ME WITH THE CLARITY OF DAY BREAK: LEONARDO DA VINCI WOULD BE USING THE COMPUTER IF HE WAS ALIVE TODAY
>
> **RYAN KINGSLEIN**

"One of the biggest hurdles of developing ZBrush was working with a user's expectations," says Kingslein. "ZBrush is considered this free, artistic tool. It focuses on making you do the work. In DAZ, for instance, its focus is on doing the sculpting work for you"

Leonardo and Michelangelo dedicated their lives to studying the science of the human figure as well as the art

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2013 Scientific and Engineering Award To Ofer Alon for the design and implementation of the ZBrush software tool for multi-resolution sculpting of digital models. ZBrush pioneered multi-resolution digital sculpting, transforming how artists conceive and realize their final designs. ZBrush has enabled artists to create models far more quickly and with much greater detail than previous approaches.

APOLLO: ANIMATING THE FUTURE

With its new software Apollo, DreamWorks has created the future of animation tools. We spoke with CTO Lincoln Wallen and head of character animation Simon Otto to learn how the tool could change 3D animation forever

Can you tell us how and why Apollo was first created? What problems was it designed to solve?

Lincoln Wallen At DreamWorks Animation, we rely on a high-performance computing infrastructure to digitally manufacture our animated films. Resource and performance demands increase as our filmmakers envision ever more stunning visuals and amazing characters for the next movie. In the past, computer performance upgrades followed Moore's Law where processor clock speeds regularly increased. However, several years ago, we identified that future CPUs would soon have more cores – but that each individual core would not be faster, thereby providing far less of an impact unless there was a fundamental change in how the software used processor cores.

To prepare for the paradigm shift and scale with new hardware, we identified that we had to rearchitect our proprietary animation platform to take advantage of scalable-multiple-core computing. Over the last five years, our engineers have collaborated with studio artists on the development of Apollo, beginning with two key software applications: Premo and Torch. Both of these groundbreaking applications were engineered by DreamWorks Animation technologists leveraging Intel architecture, software libraries and tools to achieve levels of interactivity that enable artists to work at the speed of creativity.

Previously animators would have to rework and re-render before they could see changes in effect, but Apollo offers a real-time look at changes on the fly, making everything much more efficient

Apollo: animating the future

Apollo itself is a revolutionary new Digital Design and CG Media Platform delivering a cloud-ready, enterprise-grade solution for the design and delivery of images, video and other forms of media.

It seamlessly integrates scalable multicore computing platforms from Intel, with flexible cloud orchestration of infrastructure from HP, to enable new state-of-the-art, real-time design tools and to enhance existing tools across a wide range of businesses and use cases.

Apollo represents the next generation of media creation technology, deployed in and through the cloud, already successfully used for the creation of major motion pictures.

How much faster does Apollo make your workflow? Is it a significant change?

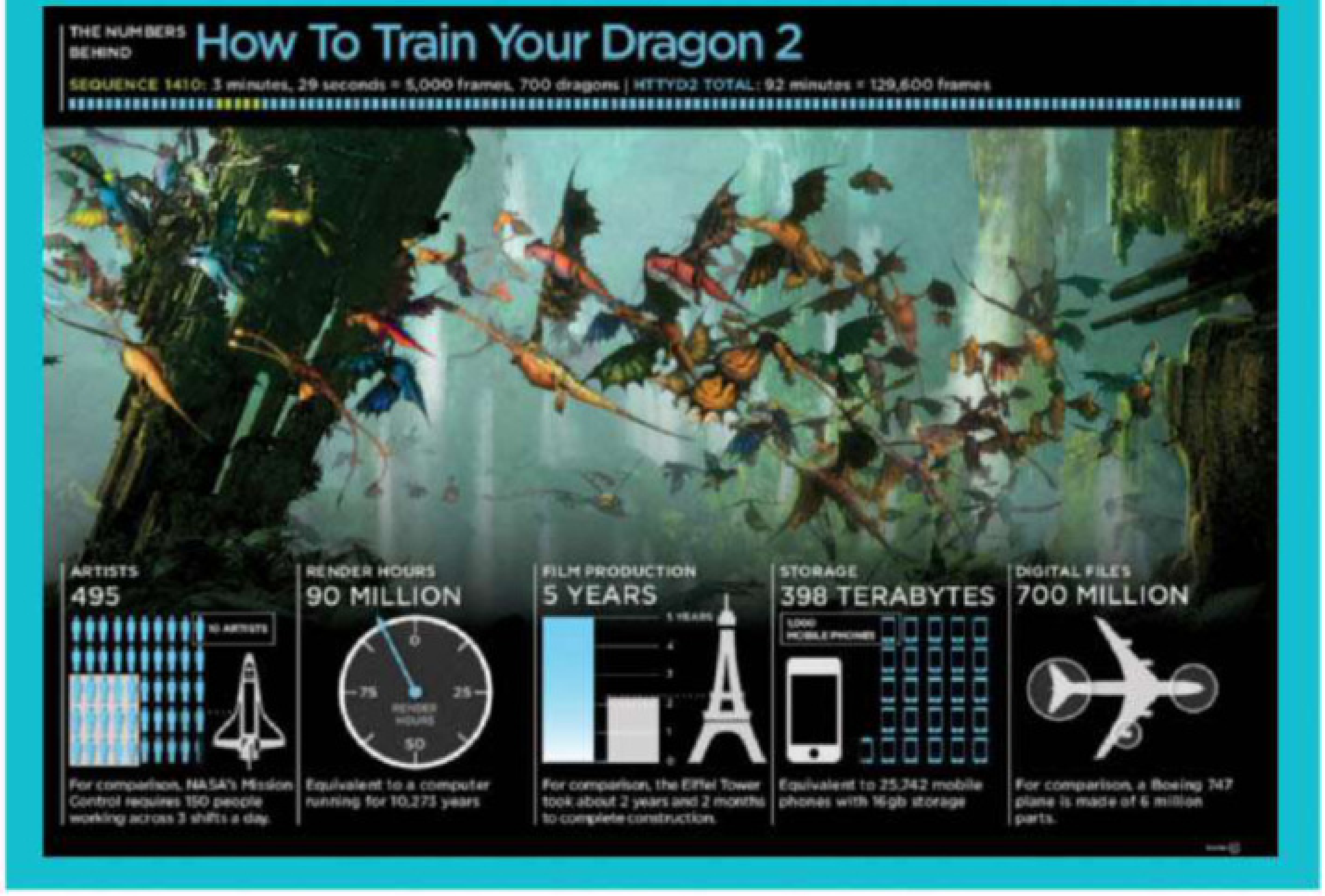
Simon Otto One of the innovative applications of DreamWorks' Apollo platform is Premo, an entirely new animation toolset that provides artists with intuitive, interactive performance. With the Premo application, our animators work in a naturalistic way that allows for much more experimentation. We can work at the speed of our imagination sculpting with a pen, like 2D animators, rather than typing data into spreadsheets.

Previously, we used a 'change, wait, change, wait' method, where changes made to character movements were typed into the software, then required compute time to calculate and render on screen. To help speed up the process, low-res images were used and environmental information was removed to reduce render time. Without knowing what the character would look like in the final movie, we made many guesses in animation performance, which later required additional fixes. This method was not only time consuming, but also broke the stream of creativity and limited the number of iterative cycles.

With Premo, we are now able to see the fully realised, high-resolution version of characters along with their detailed environments. We can precisely control characters' arms, legs, and sculpt smiles with a digital pen on pressure-sensitive tablets, moving the exact degree desired without having to wait for a calculated result. Every character is fully deforming, with hundreds of control points and musculature systems working in concert with one another. Premo gives us interactive, real-time feedback on changes or edits, so animation is as immediate and visceral as drawing straight onto a piece of paper.

ANATOMY OF AN APOLLO FILM

Apollo's first completed project was *How To Train Your Dragon 2*, but how much of a difference did it make? Take a look at some of the numbers behind the epic sequel...



Apollo enables very subtle human emotions to shine through on its character's faces, making for a much more engaging movie-going experience

One example of Premo's impact to our workflow is that training new animators is more efficient. Our previous proprietary software took a few months for animators to feel comfortable with the features and functionality. With Apollo's Premo application, a new animator can be working in the tool with production assets within one or two weeks.

Can you give a specific example of how Apollo has been used in production with reference to a specific and challenging scene? How would this scene have been animated in the past, and how did Apollo's new features help to make the process smoother?

Otto Premo allows animators to load all the detail of the full-resolution character you see in the movie. With more detail, we can make more informed decisions about character performances. We can also work on more complex scenes in general because we can now load many characters in a scene with backgrounds and still work interactively.

For example, the Bewilderbeast dragon is a very large, complex and detailed character, equivalent to the size of many dragons. Using our previous software and a low-resolution proxy, it would have been very difficult to load the character efficiently or even try to animate it. We would have had to do a lot of upfront planning of the animation first, and get approval from the director, before working digitally. We would have had to be happy with the outcome due to the time it would take to animate and then render the frames.

Using Premo enables us to explore further and ask questions such as 'how can we make the idea of dragons even fresher and new to the audience'. We've raised the bar already and pushed our expectations much higher for *How To Train Your Dragon 2*, since we don't have to wait for the computer to tell us what it's going to look like; we can actually see and make creative choices right in front of our eyes.

With Premo, we don't have a technology limitation. The animators are able to be more creative and iterate even the largest dragon in our movie interactively. We can go right into animating the character to find the right performance without having to spend time planning or having to compromise on creativity.

Whatever computing power Apollo needs at DreamWorks, the artist can get it. Both raw power and the power of the cloud are harnessed at the studio

The DreamWorks campus has hundreds of thousands of square feet office space and its own koi-laden lagoon

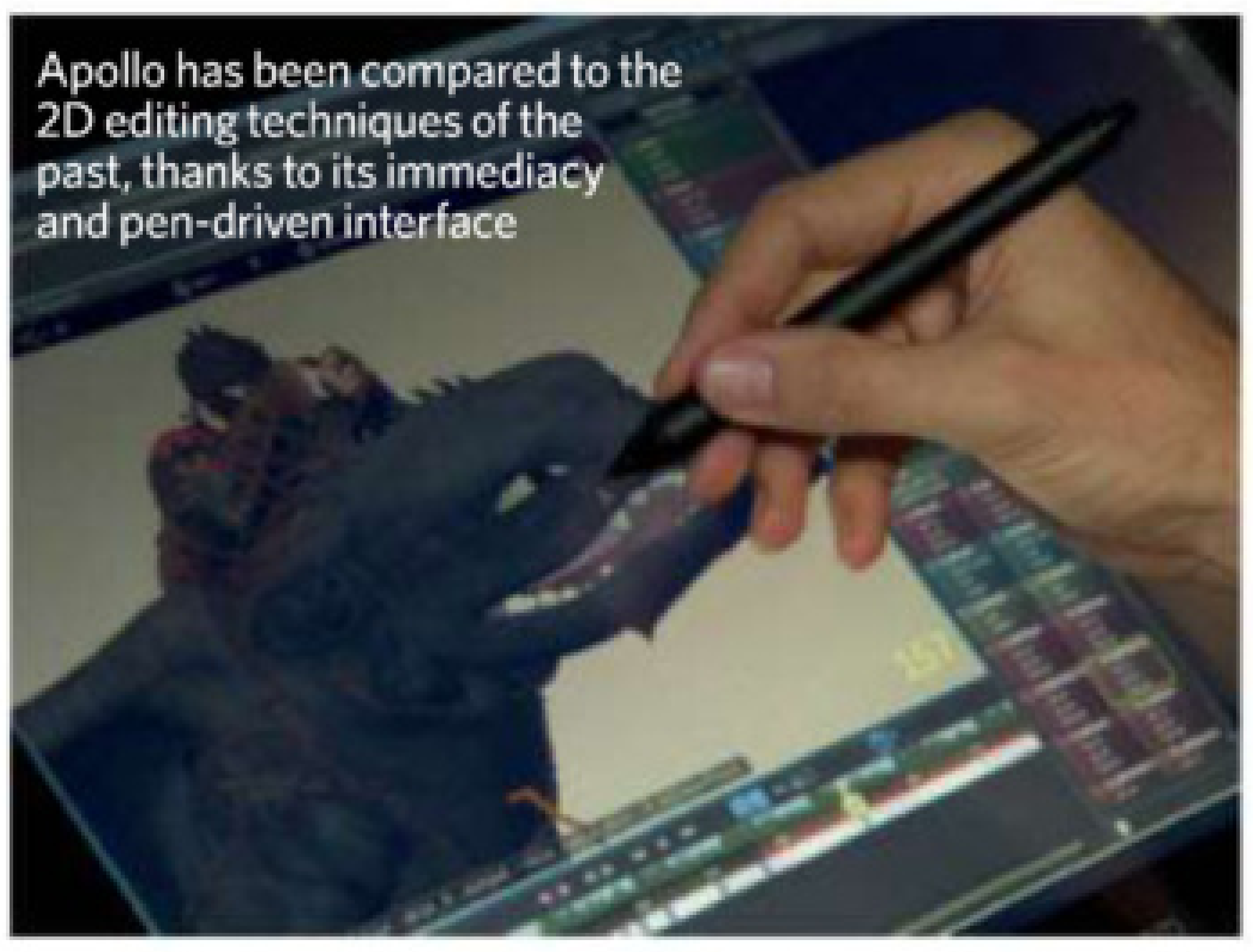
Apollo has been compared to stop-motion animation. In what ways are the two approaches similar in style?

Otto In stop-motion animation, you are able to physically manipulate the puppet – in the environment you see in the movie – by grabbing an area and pulling or pushing on it. With Premo, we are similarly using the final movie assets and directly pulling or pushing a point on the character with our digital pen. We are now able to digitally reach into final, full-resolution assets from our movie and dramatically change the way character performances are created.

Can you tell us a little about the lighting system Torch, and what this brings to things? How exactly does it work in real-time?

Wallen Lighting is an important part of storytelling, providing drama, setting the mood and plunging the audience into the environment. Previously we had developed our own lighting system, which won a Scientific & Technical Academy Award in 2013. The software provided our artists with an incredible amount of control and the ability to light multiple characters in a scene.

In *How To Train Your Dragon 2*, the animation of characters like Hiccup is far more convincing


Apollo has been compared to the 2D editing techniques of the past, thanks to its immediacy and pen-driven interface

HOW DOES APOLLO MAKE LIFE EASIER?

Here's ten key points to take on board as to what Apollo actually simplifies on a day-to-day basis

1 Previously, it took a long time to make the simplest of edits to a project – Apollo means changes are quick, flowing and easy.

2 Part of that speedier editing comes from the fact that rendering is handled in real-time, so changes and updates can be seen as you work.

3 A lot of artists come from a 2D background – having to battle with software didn't come naturally to them. Apollo allows for an approach akin to 2D editing, making it easier to get to grips with.

4 Torch, the new lighting solution, automatically makes sure you have the most updated files and draws from millions of files to let you create the perfect lighting setup.

5 Projects can be tiny, personal and on a small scale, or they can be gigantic epics (like *How To Train Your Dragon 2*, of course). Apollo suits pretty much all approaches.

6 The lack of roadblocks in the software means those working with Apollo are able to maintain their creative processes, facilitating an atmosphere of imagination, rather than one of battling with tools.

7 The cloud is involved with everything these days, and why not? Harnessing the power of the cloud, Apollo provides much more computing power than it would on a lone machine.

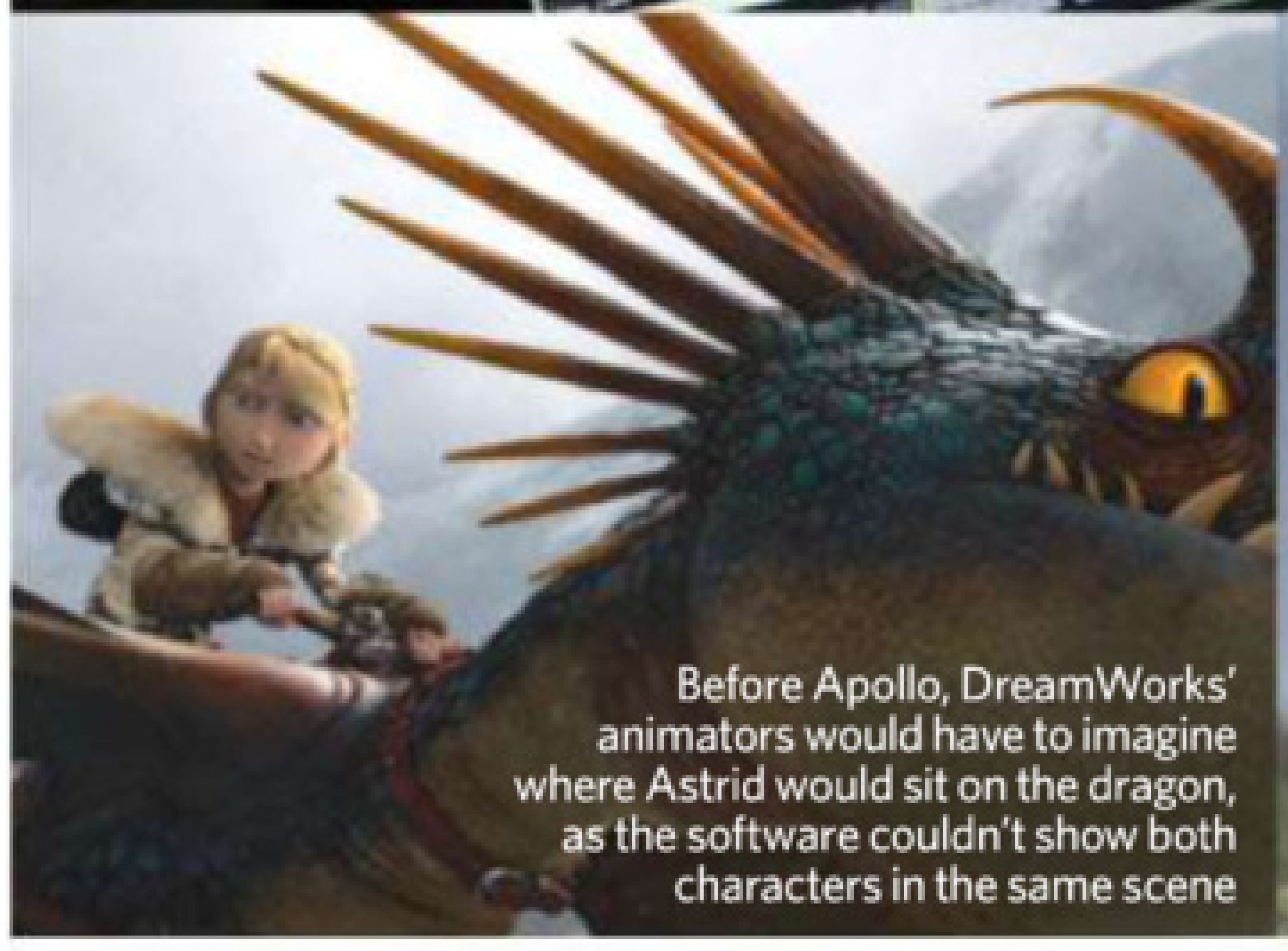
8 It's easy to arch eyebrows. No, really! In *How To Train Your Dragon*, the simple process of animating an eyebrow took a real time investment. With Apollo, it can be modified as you work.

9 Speeding up any process is good not just for the individual project, but for a production studio as a whole. More time means more potential projects, which ultimately means more creativity and more exciting experiences for the viewer.

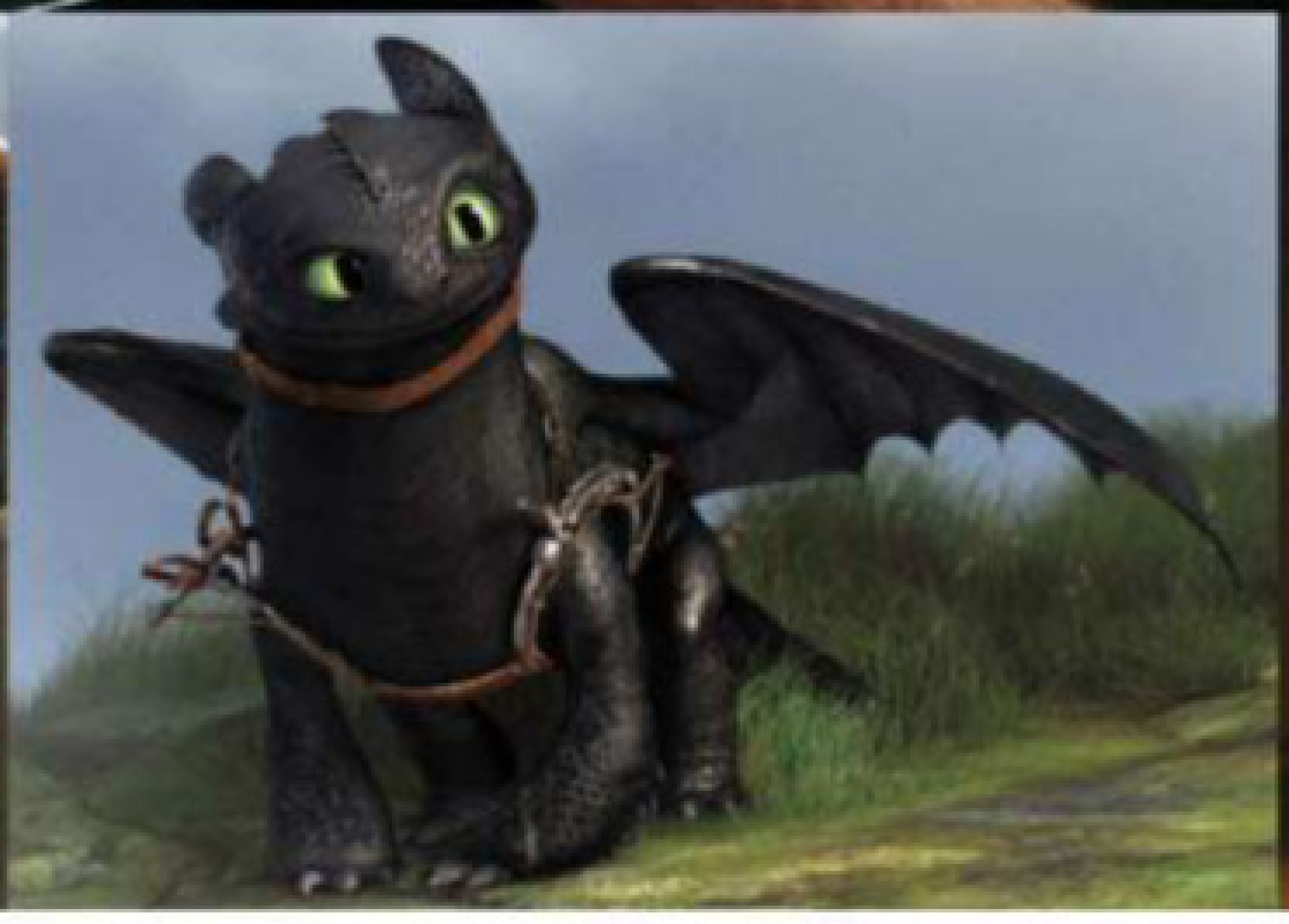
10 It's not available right now, but there are plans at DreamWorks to sell licenses of Apollo in some form in future. A solid competitor to the main 3D tools could mean an increase in innovation overall!

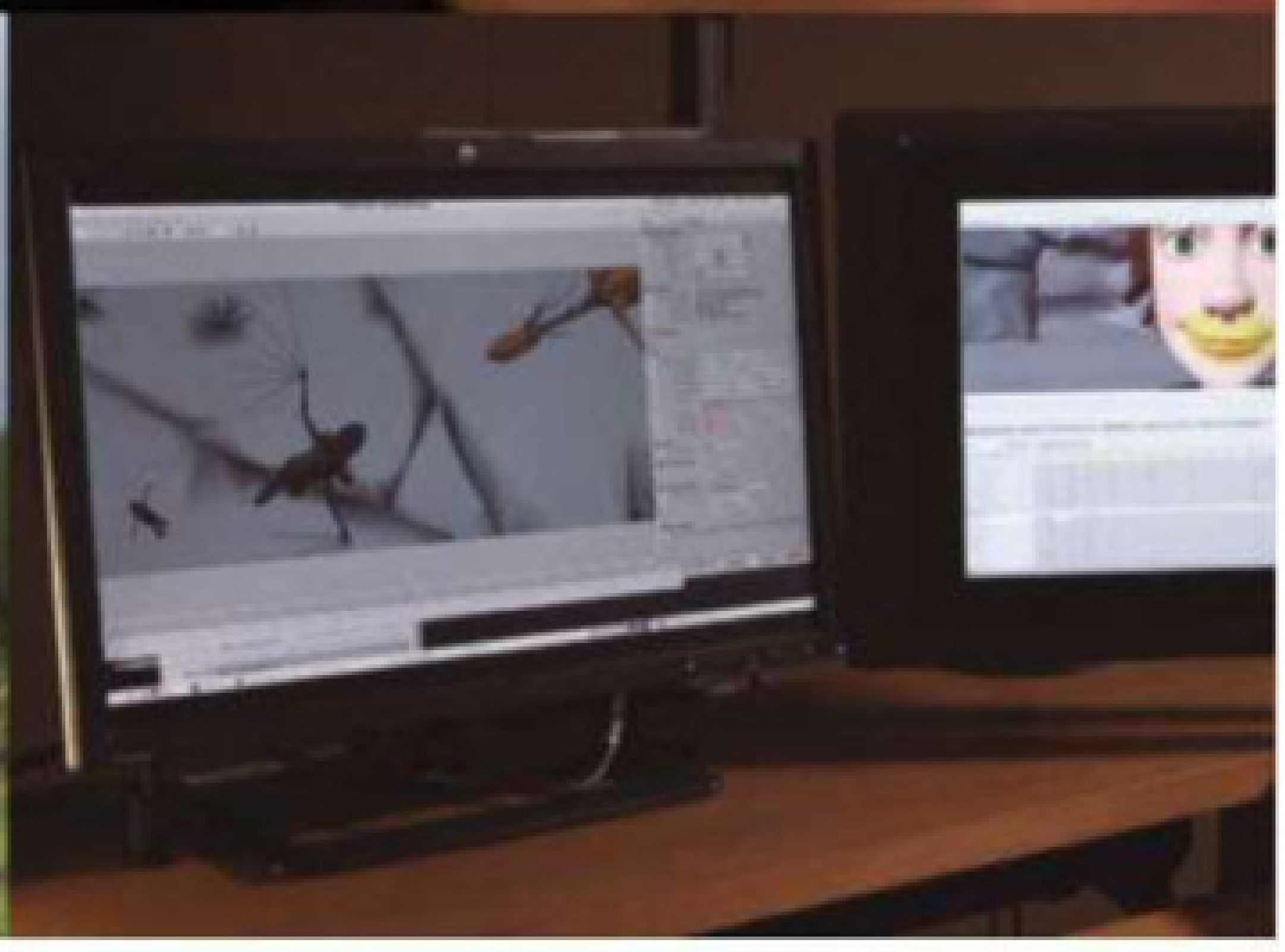
Apollo: animating the future

Real-time animation really is the future of the industry – it truly empowers artists' creativity and imagination



Before Apollo, DreamWorks' animators would have to imagine where Astrid would sit on the dragon, as the software couldn't show both characters in the same scene





We first used this software to handle lighting a sequence for the movie *Antz*, involving a crowd of 7,000 ants in a single frame. However, similar to Premo, the tool was not very interactive and the constant management of changing digital assets kept artists from spending time on the important work of lighting.

Apollo's Torch application is our new lighting software; rearchitected from the ground up. It empowers individual artists to create a vast amount of imagery through the management of millions of files across 12 creative departments, hundreds of artists and from thousands of iterations. Artists easily navigate those files with an intuitive graph interface and can ensure that the latest updates are brought into the right images at the right time. Using Torch, artists are able to view lighting setups on film-quality assets as they happen on the screen, without having to wait for the computer to calculate any of the changes.

Apollo enables multiple characters to be animated in a single scene – how and why does this help animators? What does it make possible that wasn't available previously?

Otto Being able to animate multiple characters in one scene is particularly important when those characters are interacting very closely. In the first movie using our previous software, animators had to imagine where Hiccup would sit or where his hands would be placed on Toothless because we could not interactively animate the characters concurrently. After rendering both character performances in the scene, the animation would have to be adjusted to ensure the right placement.

Animating Hiccup and Toothless in Apollo's Premo application at the same time means that we don't need to guess anymore. We know exactly where to place the characters and we can really focus on creating those close moments that you see in the film.

How many characters can appear in a single scene?

Wallen We are only limited by the compute power we choose to assign to that scene. So, essentially, we are not limited at all. The Apollo applications are scalable, which means that if we choose to have dozens or even hundreds of characters in a scene, we simply need to assign the necessary computing power to the artists working on those shots. With over 20,000 computing cores in our cloud environment, that's not a problem.

What level of detail can Apollo go down to? What are the smallest elements that can be changed?

Otto In Apollo's Premo application, we can go to whatever level of detail we want, if it makes sense for the story and the character performance. Our modelling and rigging teams are able to build complex controls for what our animators need because they can all be run interactively in Premo. For instance, Hiccup's eyebrows have multiple controls in order for us to sculpt how expressive he is with his eyes. Another example is that the Bewilderbeast dragon has thousands of spikes that we can control individually, which is especially important for close, emotion-driven shots.

What kind of impact do you think these tools will have on the future of DreamWorks Animation productions? How has it altered the way you approach projects and work on them?

Wallen Apollo has changed our entire approach to the production process. What was once linear and limited is now collaborative and scalable. With Apollo, artists have the ability to explore and implement ideas that are spontaneous, no longer requiring significant planning to try an approach.

Historically, CG animation has been a highly planned process, which allows for very little in-the-moment inspiration. Apollo changes that for every element of DreamWorks Animation's filmmaking process.

Finally, we have to ask, will we ever get a chance to use Apollo? Will it be licensed?

Wallen Yes, DreamWorks is actively considering commercial opportunities for the Apollo platform, so keep your eyes peeled!

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www.hasanbajramovic.com

Location Sarajevo

Software used
ZBrush, 3ds Max, V-Ray

Expertise Hasan specialises in realistic character modelling, texturing and rendering

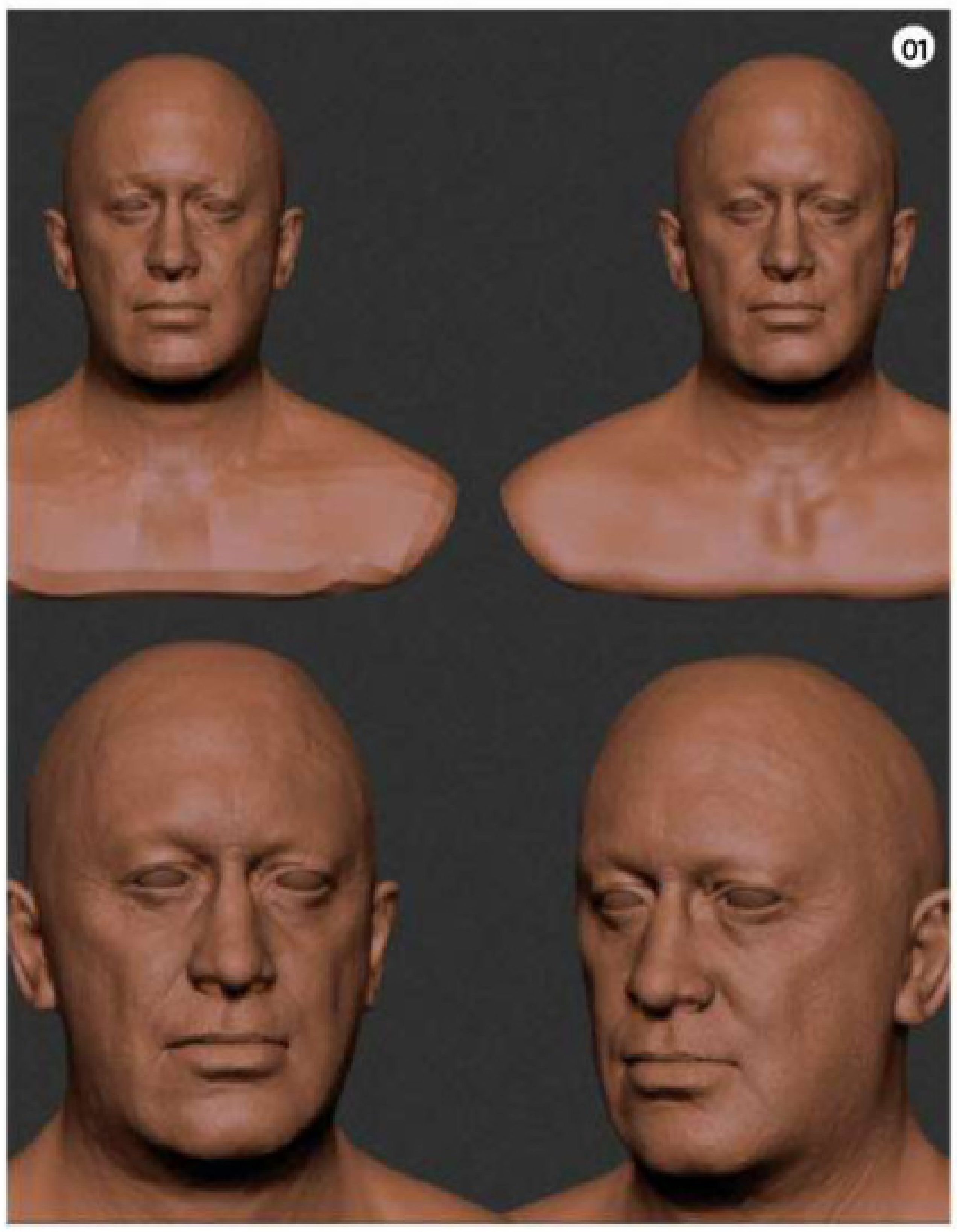
Model a fighter pilot

Fighter Pilot 2014

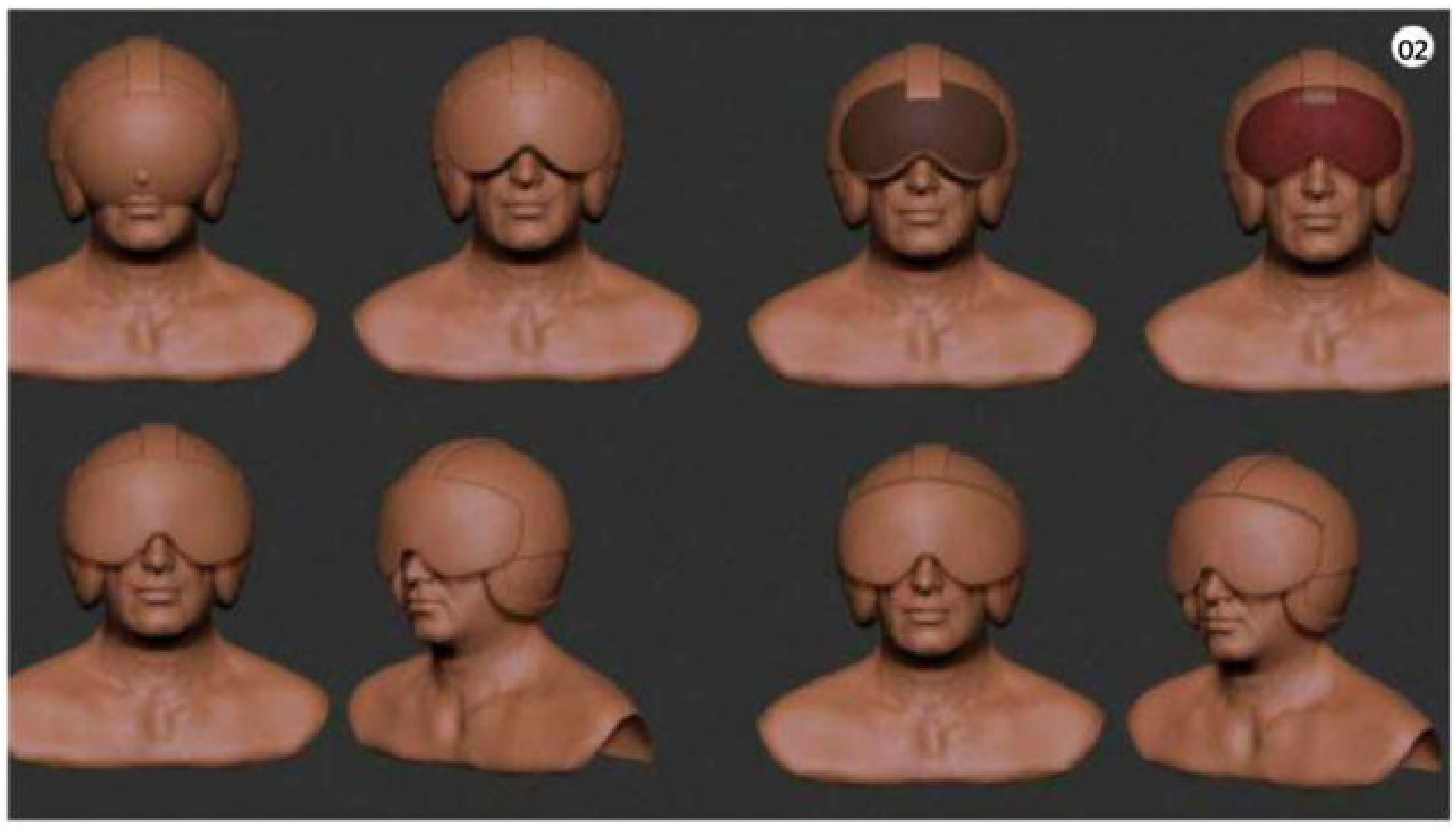
> Here I will showcase some of my modelling techniques using the example of a fighter pilot in the heat of the action

Hasan Bajramovic is a freelance character artist specialising in realistic character modelling and rendering

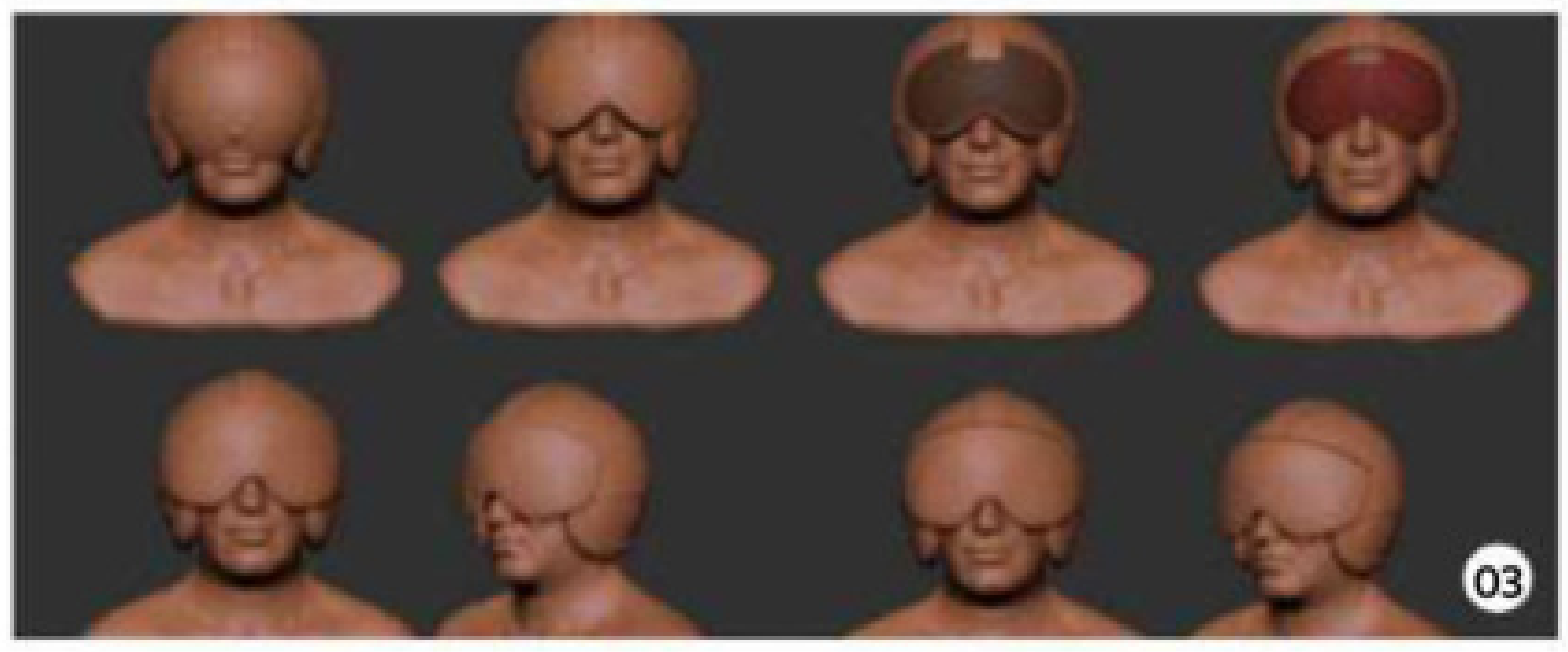
This tutorial showcases some of the modelling techniques that I use on a daily basis when doing both professional and personal work. I will cover various ZBrush tools that can really speed up your workflow, and I will finish with a quick render using sIBL. Mastering these techniques will greatly improve your creative process no matter your project. Be sure to experiment with the workflow on different ideas!



01 Sculpt the face You can start working on this model by using an existing base mesh that you may have lying around if you don't feel like sculpting from scratch. Get some quality reference images and take your time in establishing the proportions of the face. Always block in the major forms first and don't get caught in detailing straight away. Pay attention to major landmarks and observe negative space.



02 Block out the helmet Start by appending a sphere primitive to your ZTool and adjust its position so it's sitting on the scalp, then DynaMesh the sphere. Using the Clipping brush, clip the front part of the sphere and move the sides to place. Next, hide the part of the sphere that you've pushed inside the face. I usually just mask that area and create a new PolyGroup from it. Delete it and use ZRemesher to create a clean topology. Add some thickness by using Panel Loops. Play with settings until you get the look that you want. Next, create a few more panels on the helmet using the same technique, but this time use the helmet as a base. Duplicate the helmet SubTool by hitting Cmd/Ctrl+Shift+D and hide the areas where you don't want the thickness. Delete the hidden geometry and do a Panel Loop on it. Repeat as necessary.



03 Create the visor Append a sphere as a new SubTool and tweak its size. Convert it to DynaMesh and then use the Move brush so it resembles a pair of shades. You can smooth it out using the Trim Dynamic and hPolish brushes, but keep the Z Intensity low. Mask the front part and create a PolyGroup from it, then add thickness with Panel Loops.

Panel Loops

Delete the hidden geometry and add Panel Loops to it. Repeat this step as many times as necessary until you get all the details that you need. This is a very quick and easy way to add some detail to your model. Experiment with the Panel Loops and Group Loops and you'll be amazed with the results.

Learn how to

☑ Sculpt a realistic model of a pilot using ZBrush and 3ds Max

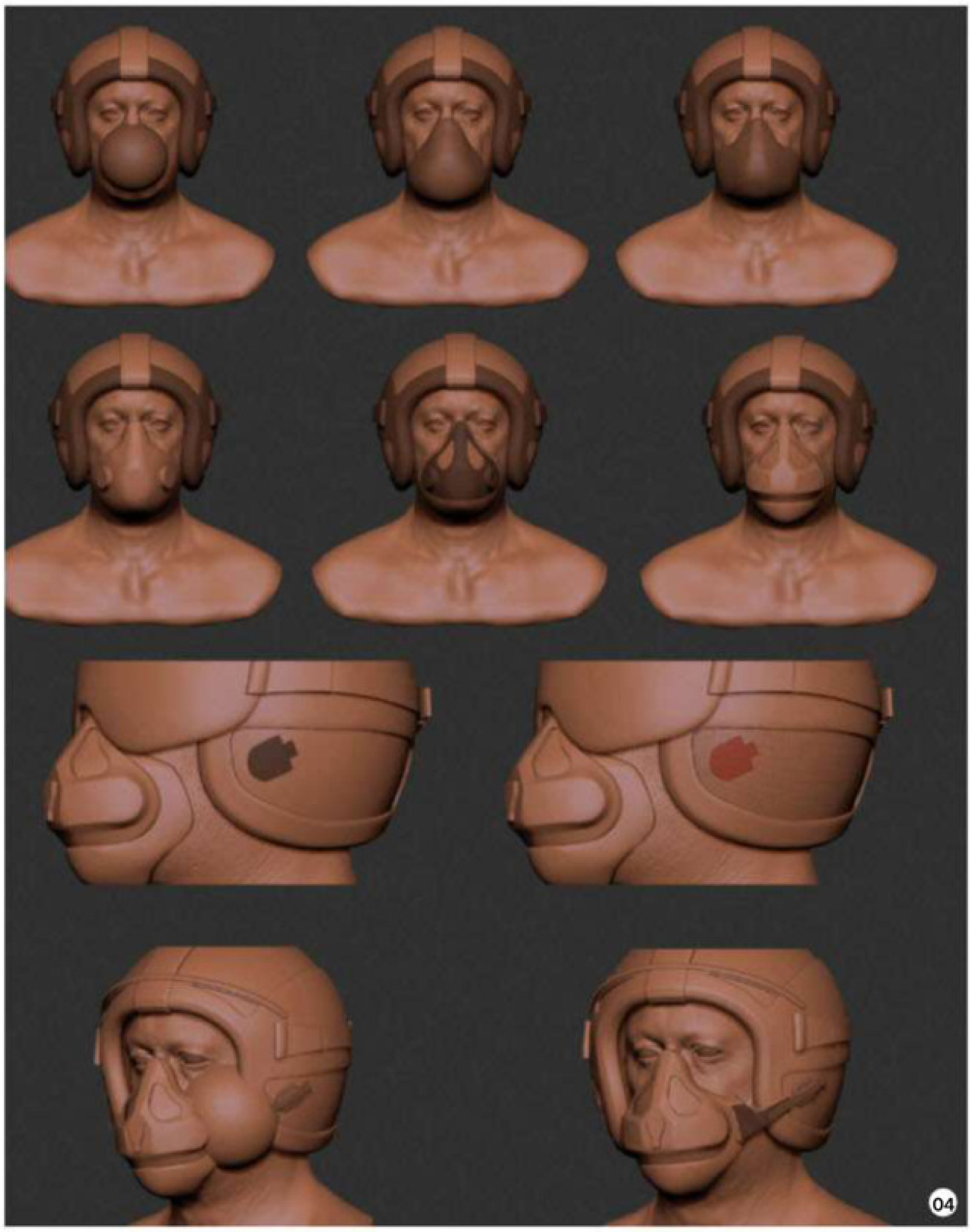
With the Disc

Tutorial files:

- Custom IMM brushes
- Tutorial screenshots

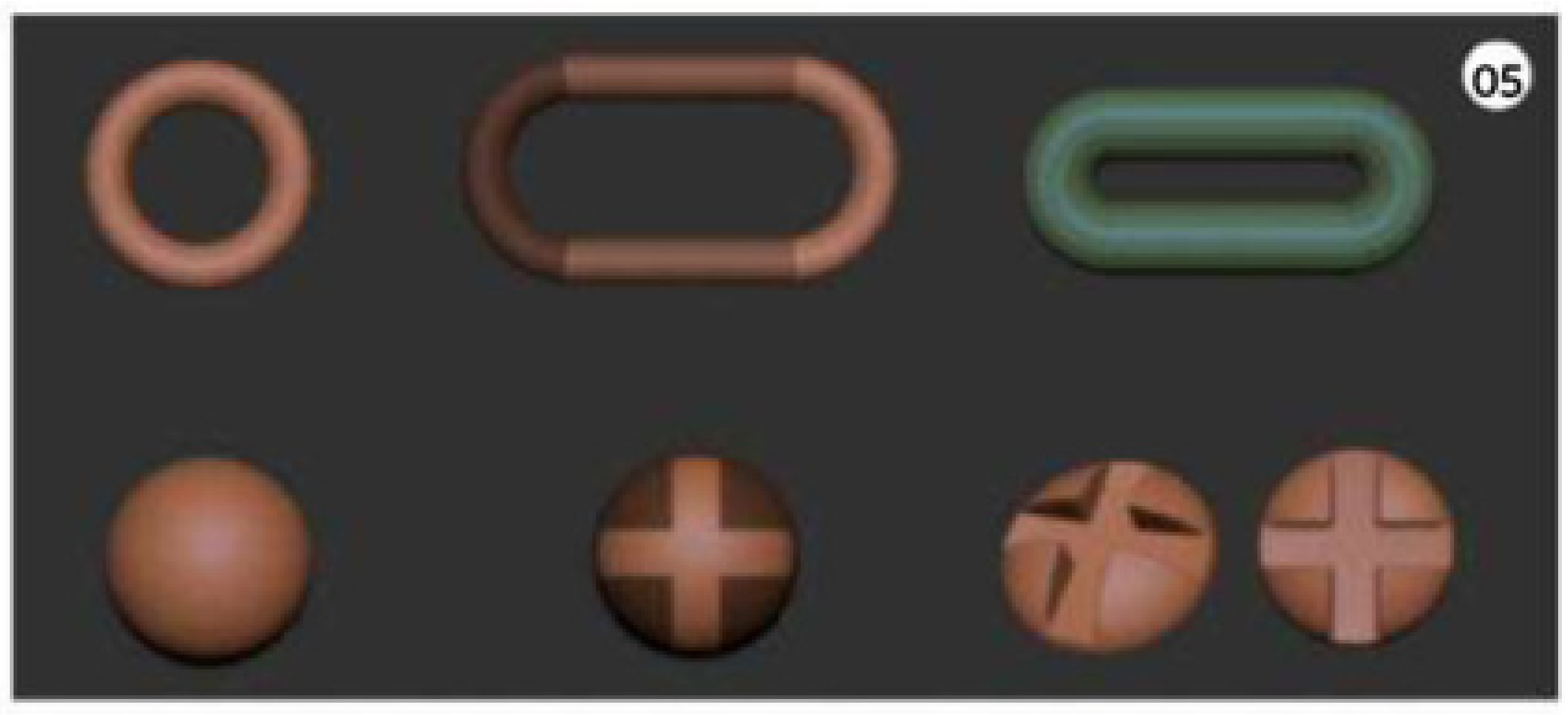
Concept

For this tutorial I wanted to create a render that seemed like the pilot was taking a selfie while flying high up in the air.



04 Model the breathing mask

As with the previous three steps, append a sphere and tweak its shape using the Move tool. Using the Insert Cylinder brush, draw out two cylinders. Create the top layer of the breather by masking the area and extracting it, then experiment with thickness until you get good results. Use the Trim Dynamic brush to create sharp edges and better transitions. ZRemesh it and move on to the next segment of the breather using the same technique. Experiment with different tools and try to find a workflow that works best for you. Keep things clean and don't worry about having elements as one object; as you can separate them into different SubTools for easier adjustments.

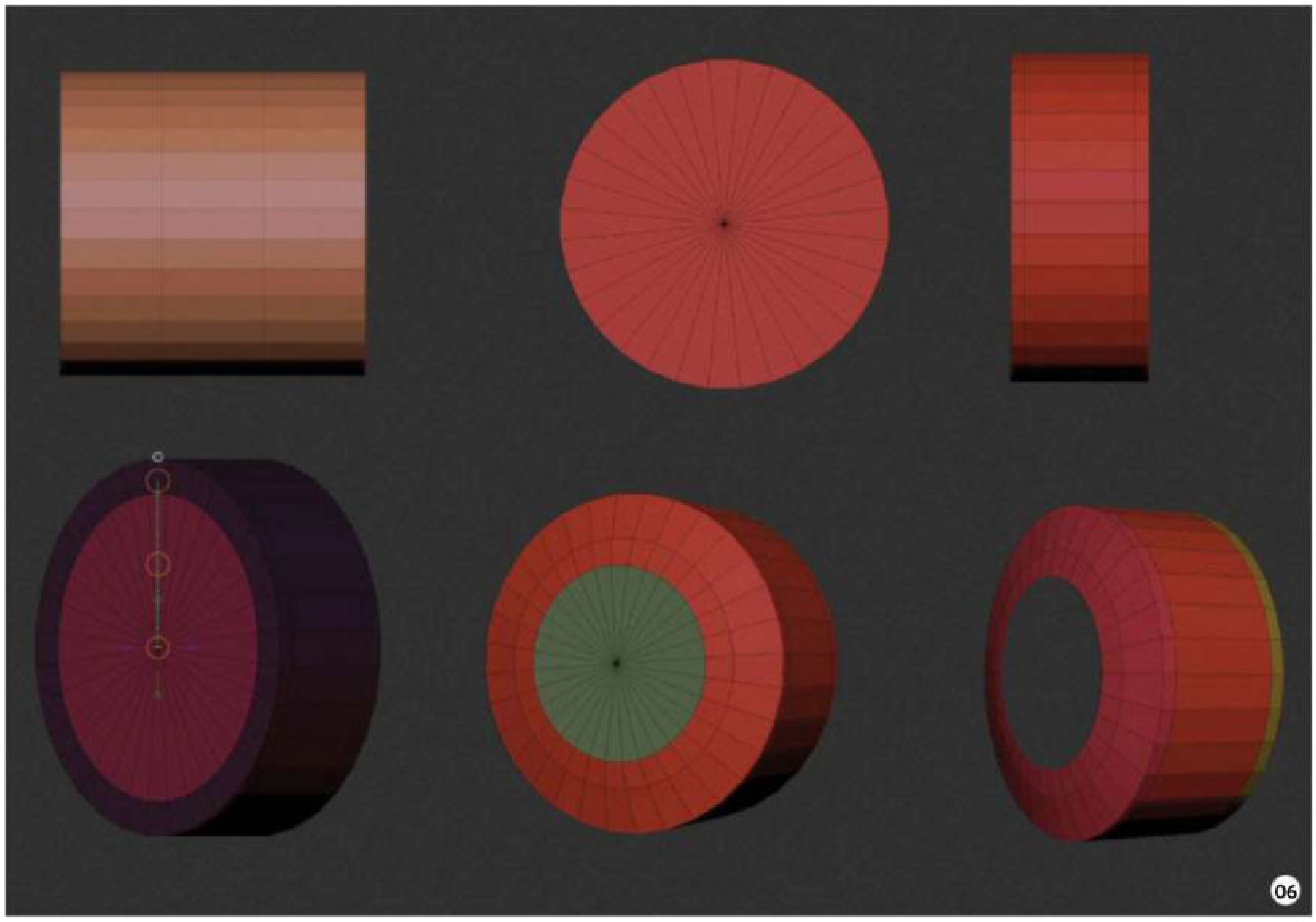


05 Create custom IMM brushes

Custom IMM brushes are a lifesaver when it comes to detailing. I have provided a few simple brushes with this tutorial, but it's best to create them by yourself: remember, you gain experience with each stroke you make inside ZBrush. You can use whichever technique you want when creating these. It's the result that matters. Once you're done modelling, go to the Brush menu and hit Create Insert Mesh button. Orientation is important when making these, so to modify your IMM brush placement and stroke go to the Stroke menu and under Curves, enable Curve mode and Bend. Set your IMM Brush segment to span as a single piece of geometry rather than separate segments, then hit Weld Points under Brush>Modifiers. Play with different settings to get a feel for what each one does.

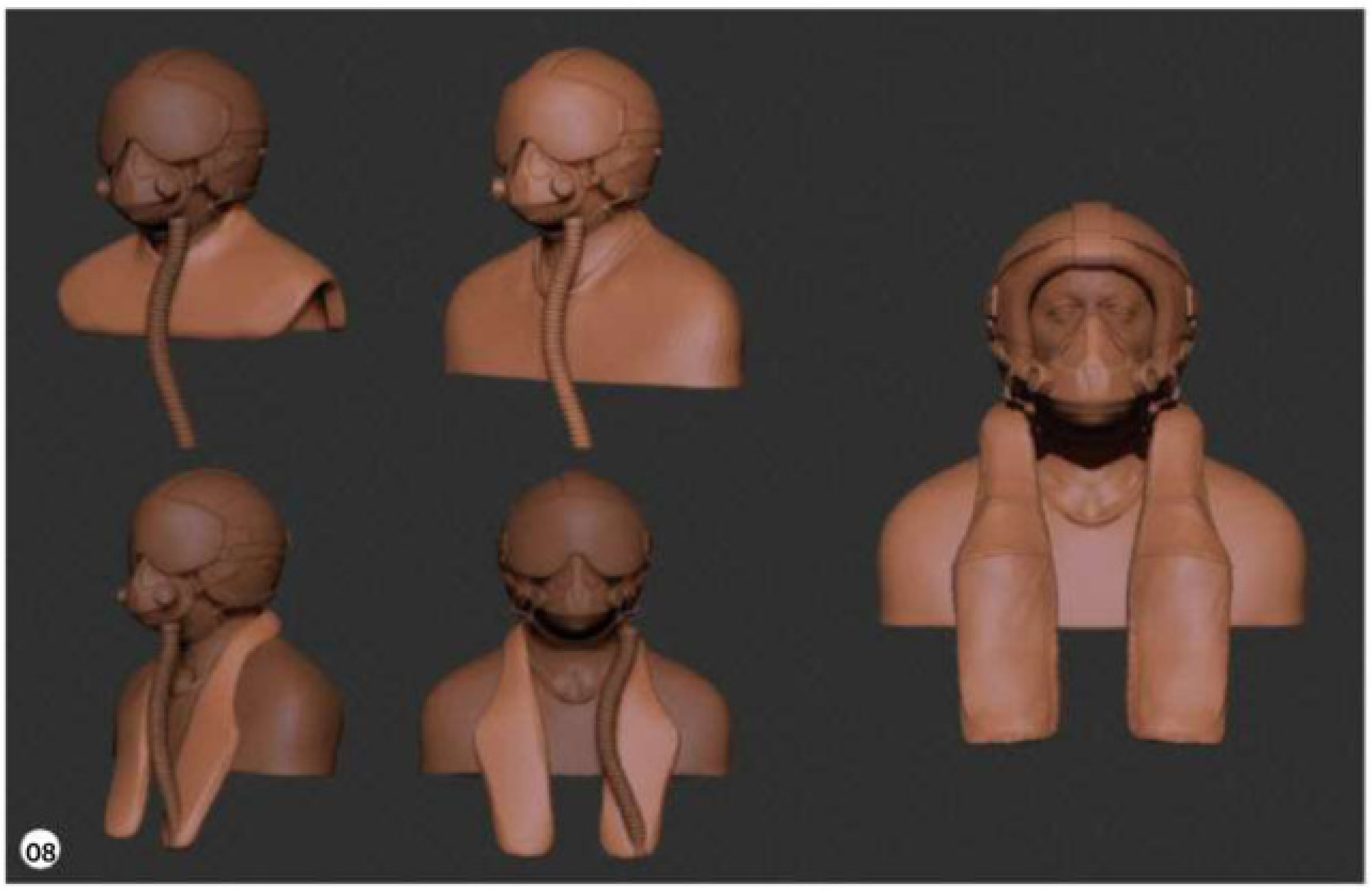
06 Finish the mask with poly modelling

Select a cylinder SubTool and under Initialize, set HDivide to 32 and VDivide to 6. After that, hit Make PolyMesh3D and use the Masking and Transpose tools to move the sides closer to the two edges in the middle. Next, create two separate PolyGroups for each one of the caps of the cylinder. We're doing this so we can mask these two segments later on. Mask everything but one of the caps and then drag the Transpose tool straight from the middle by holding the Cmd/Ctrl and clicking on the top circle of Transpose, dragging it towards middle. Continue extruding, hiding and deleting polygons until you get the desired shape. Once you're happy, add a Panel Loop on it to get some thickness. Append and align the newly created geometry to the breather part of the mask.



07 Create the hose The easiest and fastest way to create the hose on the breathing mask is to use an IMM brush. You can easily create one yourself using all of the above mentioned techniques or you can just get one for free either on ZBrushcentral IMM brush repository or on the BadKing website. Registration is free and there is a lot of free and cool stuff over there. For the purpose of this tutorial, I grabbed the Corrugated Hose Brush Set.

08 Block out the shirt and buoyancy aid Mask the area from the lower part of the neck to the shoulders, DynaMesh it and then move it around until you get a decent-looking base for the shirt. Next, create the base of the buoyancy aid by using the masking technique. Sculpt it until you get something similar to the corresponding image. You can add as many details to it as you like, but I just created some basic seams using the Dam Standard brush. Once you're done, create topology for both of these SubTools using ZRemesher.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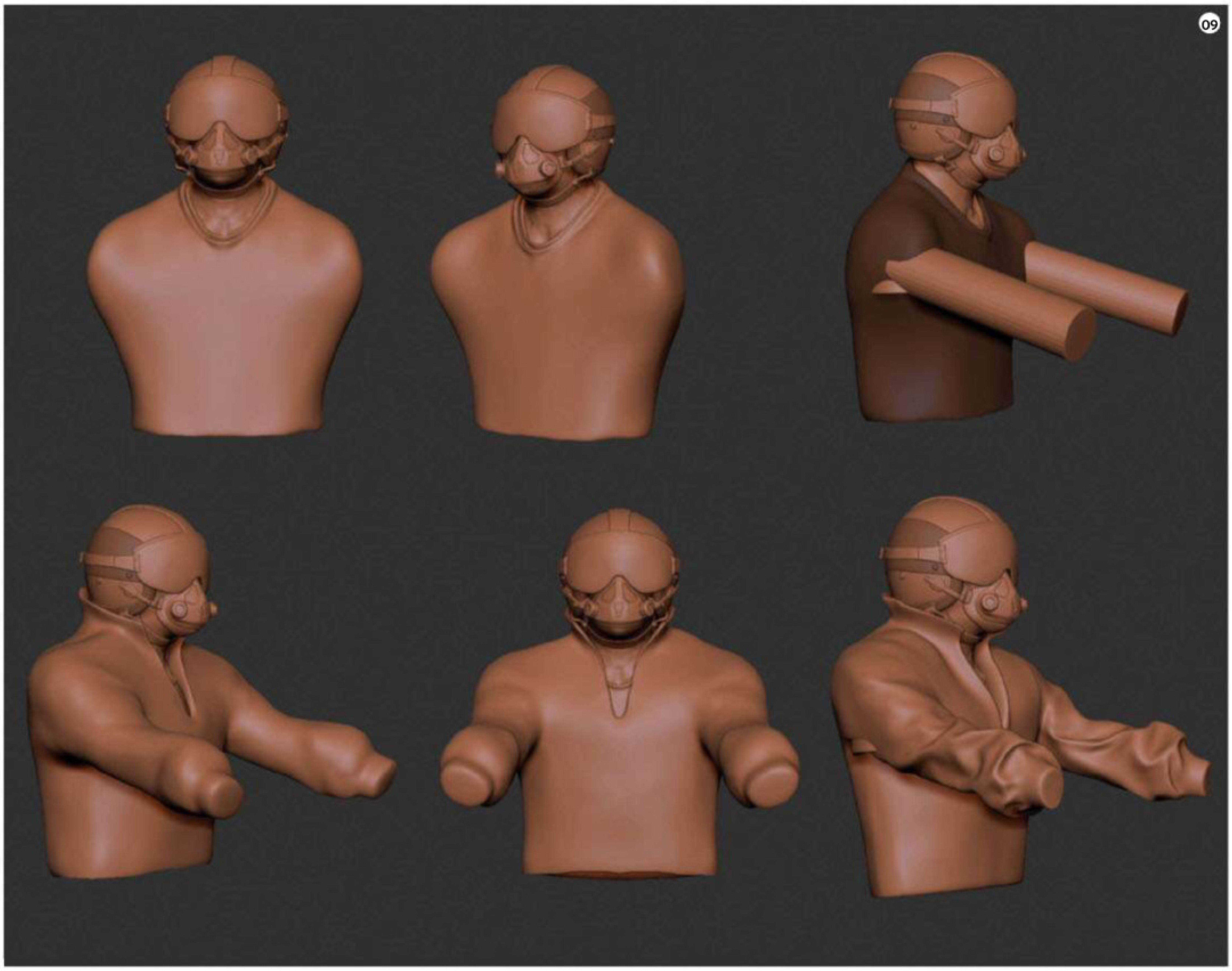

09

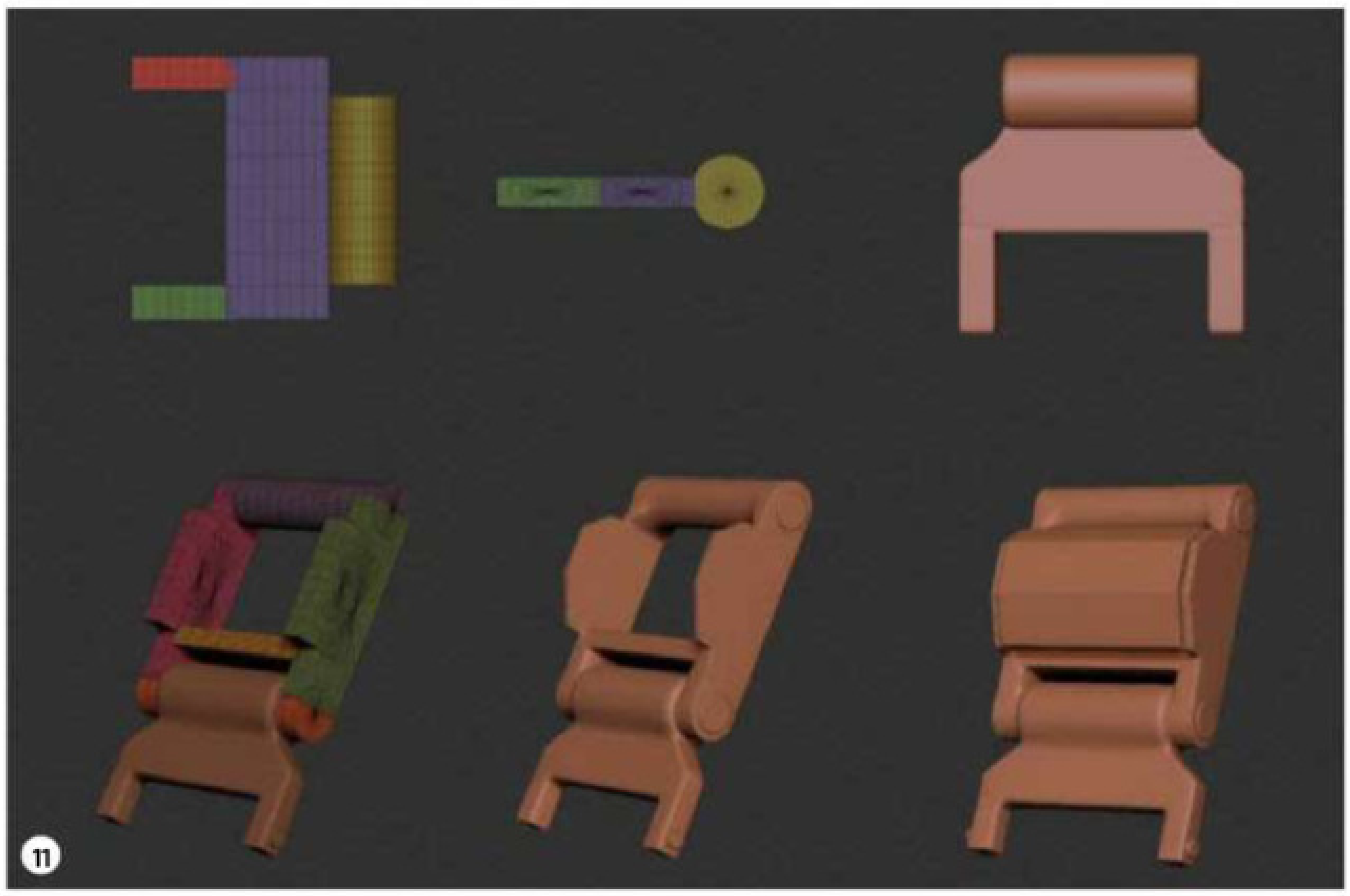
09 Block out the jacket Duplicate the shirt SubTool by pressing Cmd/Ctrl+Shift+D and extend the lower part. DynaMesh it so that you get equal polygon distribution, then select the Insert Cylinder brush and hit X to enable symmetry. Drag the Insert Cylinder brush from the shoulders and position them as in the accompanying image. Cmd/Ctrl+drag on the Canvas to DynaMesh again. Next, using the Clay brush, slowly start adding volume on the sleeves and create the jacket collar. I use masking a lot when creating major folds. I just move them inwards and then I get back in with a Standard brush to create transitions and additional folds. Keep on working on the folds and creases until you get something that you're happy with.

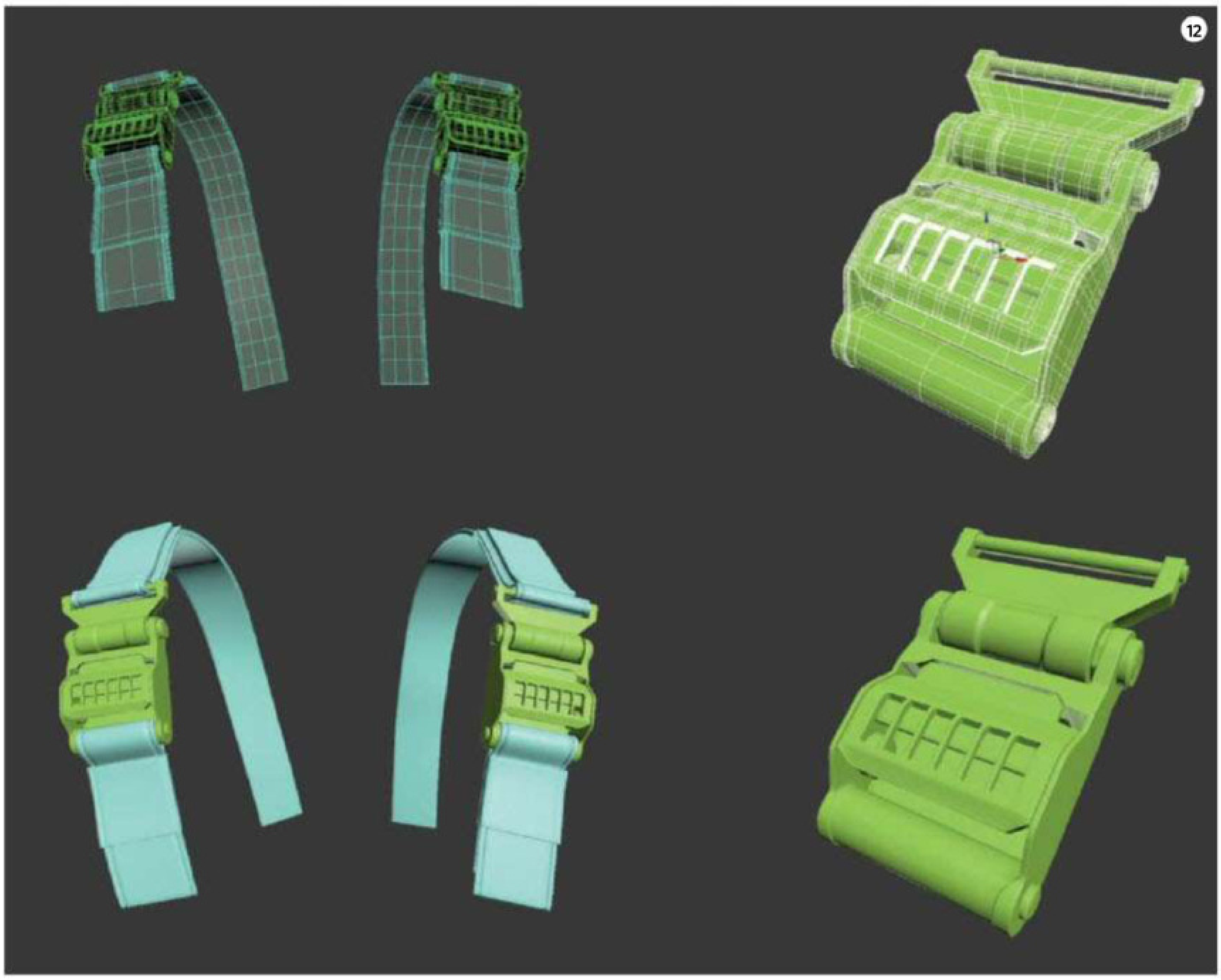
Create folds

Be careful when creating folds for the jacket. Take your time and analyse. Get some references of how fabric drapes, especially as thick fabric doesn't drape the same way as silk. You want to achieve the right amount of wrinkles and creases.

10 Detail the jacket Add some detail to the jacket to make it more believable. Things like stitches, zips and pockets always help. For the zip you can use the Zipper IMM brush that comes with ZBrush. Patches around the zip will also help greatly. To create these, as well as the pockets, just create some masks and extract the geometry. Don't forget to ZRemesh it to keep things nice and optimised.

11 Sculpt the strap buckle I prefer using primitive objects inside ZBrush whenever I'm creating hard-surface models. Add a Cylinder and Box primitive to your SubTools. You can hide everything else at this point so you don't get distracted. Duplicate the Box primitive two more times and adjust the scale and position of each one of these until you get similar results as pictured. Merge down these SubTools and DynaMesh them to create one piece of geometry. Use the same steps to create the rest of the strap buckle. Once you're done positioning it, create some straps with the CurveStrapSnap brush that comes with ZBrush.





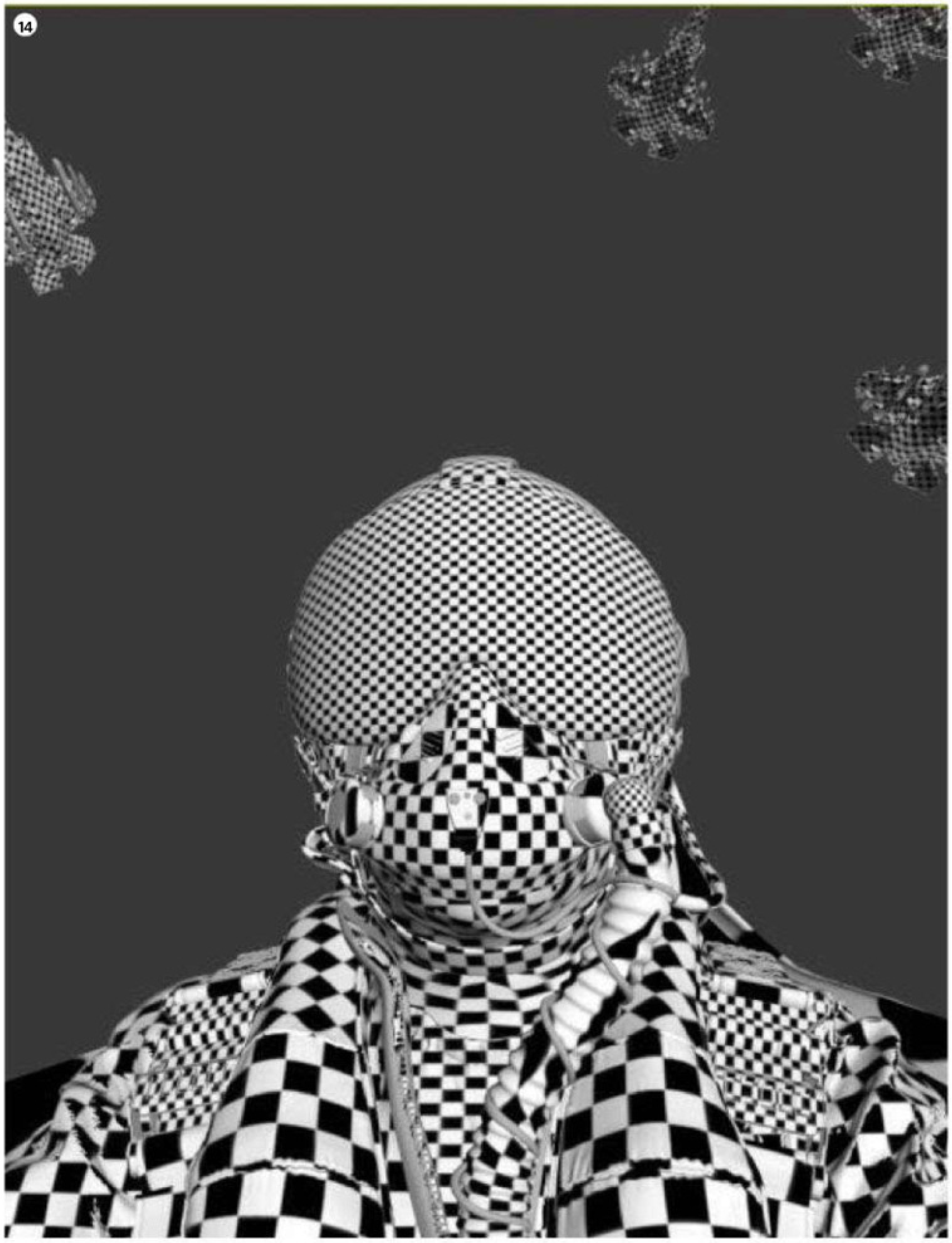
12 Poly-model in 3ds Max In my own projects, I often end up remodelling some of the geometry that I've created in ZBrush. I find it easier and faster to concept out something and then poly-model it from scratch. I did this for the strap buckle. This is a great way to get more detailed and clean geometry, especially if you plan on doing any animation.

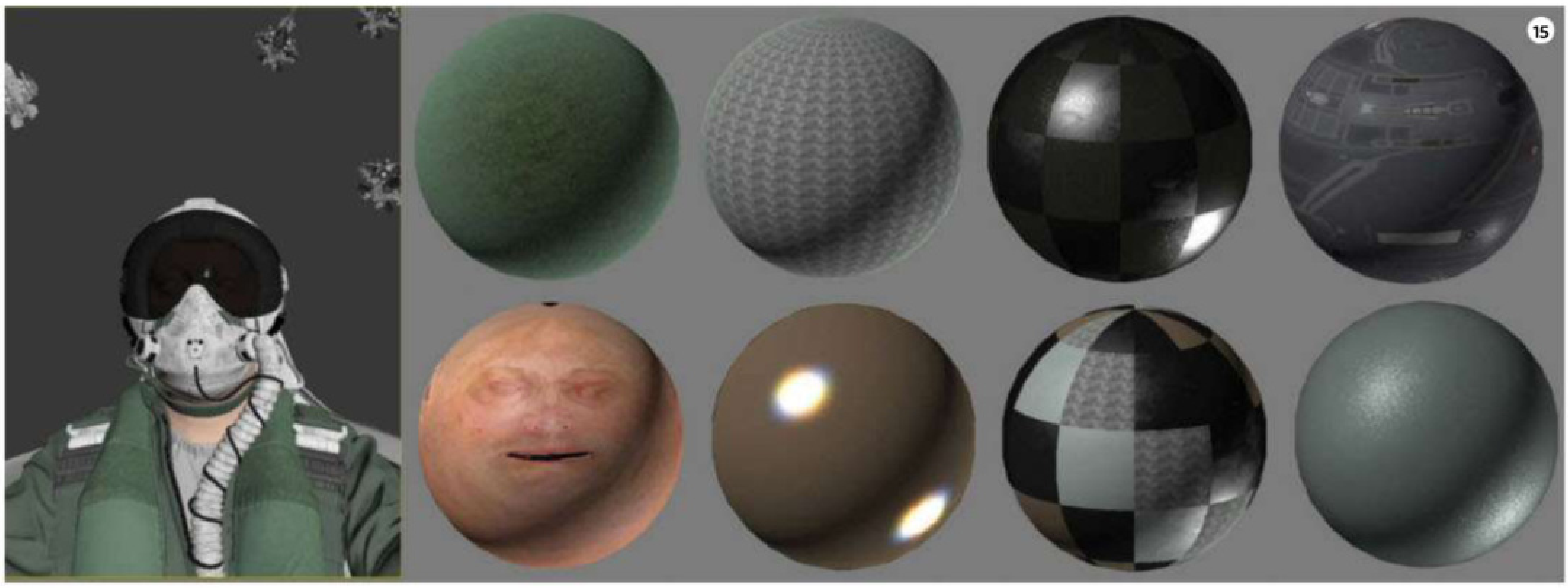
I decimated the buckle SubTool and GOZed it to 3ds Max. Once inside of 3ds Max I poly-modelled it from scratch using the decimated model as a reference image to work from. Start by putting down some large polygons and then slowly add more edges to keep the creasing consistent. You can also add some more hosing and cables at this stage using the Spline primitives in 3ds Max – just make sure that you remember to convert the splines to editable polygons.

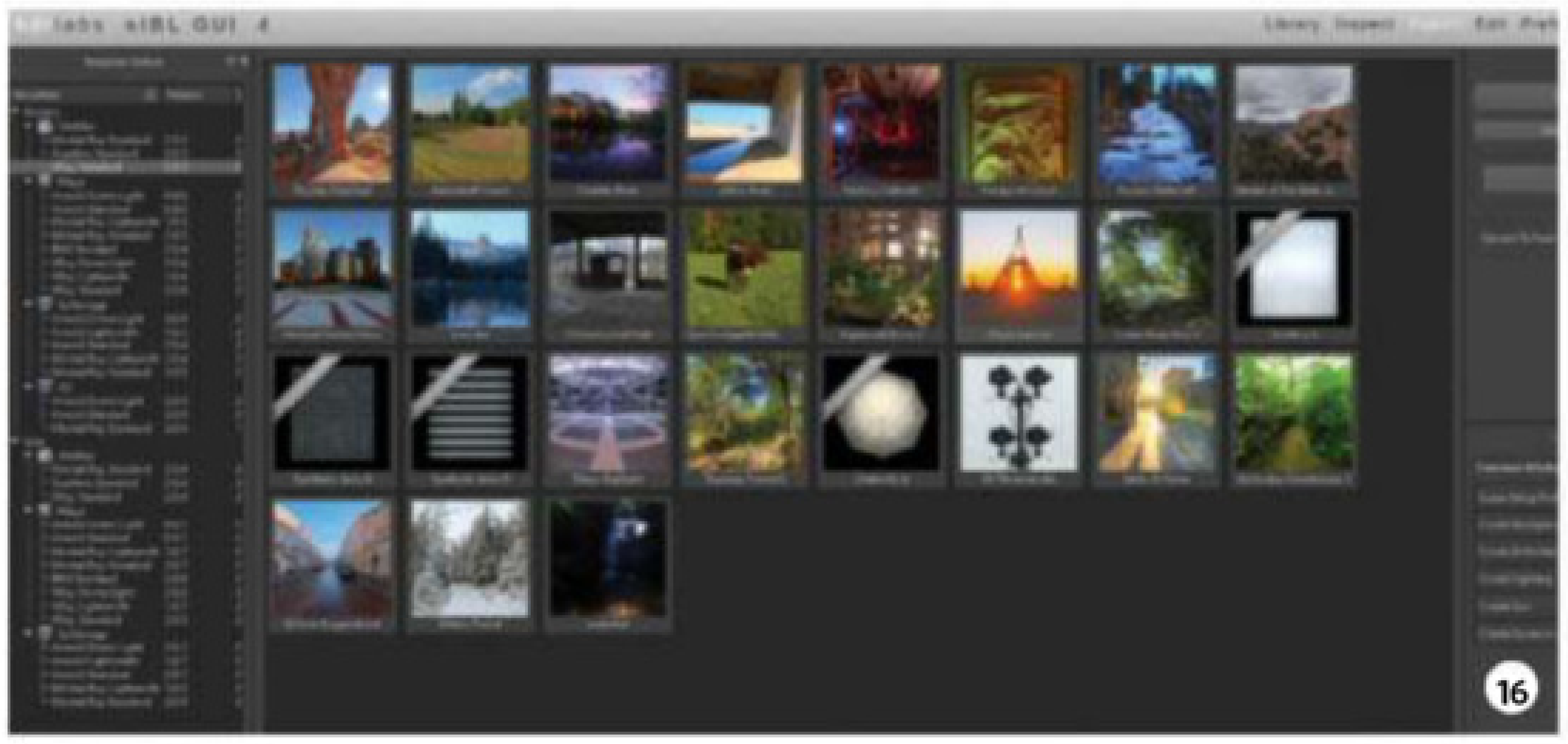
13 Adjust the proportions and review your work Once done with modelling and topology, move all your SubTools to 3ds Max or any other 3D package that you're using and start planning out your final render composition. At this stage it's a good idea to check the proportions. I ended up scaling the helmet a bit on the X axis as it was a bit too big for my liking. If you feel that you want to add any more detail to your model, now is the time to do it.

14 Create UVs To create UVs for the model I usually don't use anything more than 3ds Max's built-in UV tools, but you can use any other tool, so long as it gives good results. UV Master is another great and fast way to create UVs for your model. All you need to do is open the Plug-in menu and click on the UV Master. You can then select Unwrap and ZBrush will do the rest for you. Once you're done, move to the final stage where we'll set up some lighting using image-based lighting.

15 Create materials Begin by creating a V-Ray material for each one of the objects in your scene. Make sure you name them accordingly as this will make things easier for you later on. Search online for reference images for each of the materials and browse through CGTextures' collection. Most of the textures there are tileable and easy to set up, so look for textures of dirt, fabric and metal. Observe how the environment reflects light, then try to capture the same in your material by tiling these with a Composite shader. You can also use some of the Procedural maps that come with 3ds Max. Make sure that you add subtle Dirt and Bump maps. Break up your reflections by adding dust, scratches or fingerprints and keep experimenting with different values until you are happy.







16 Light and render

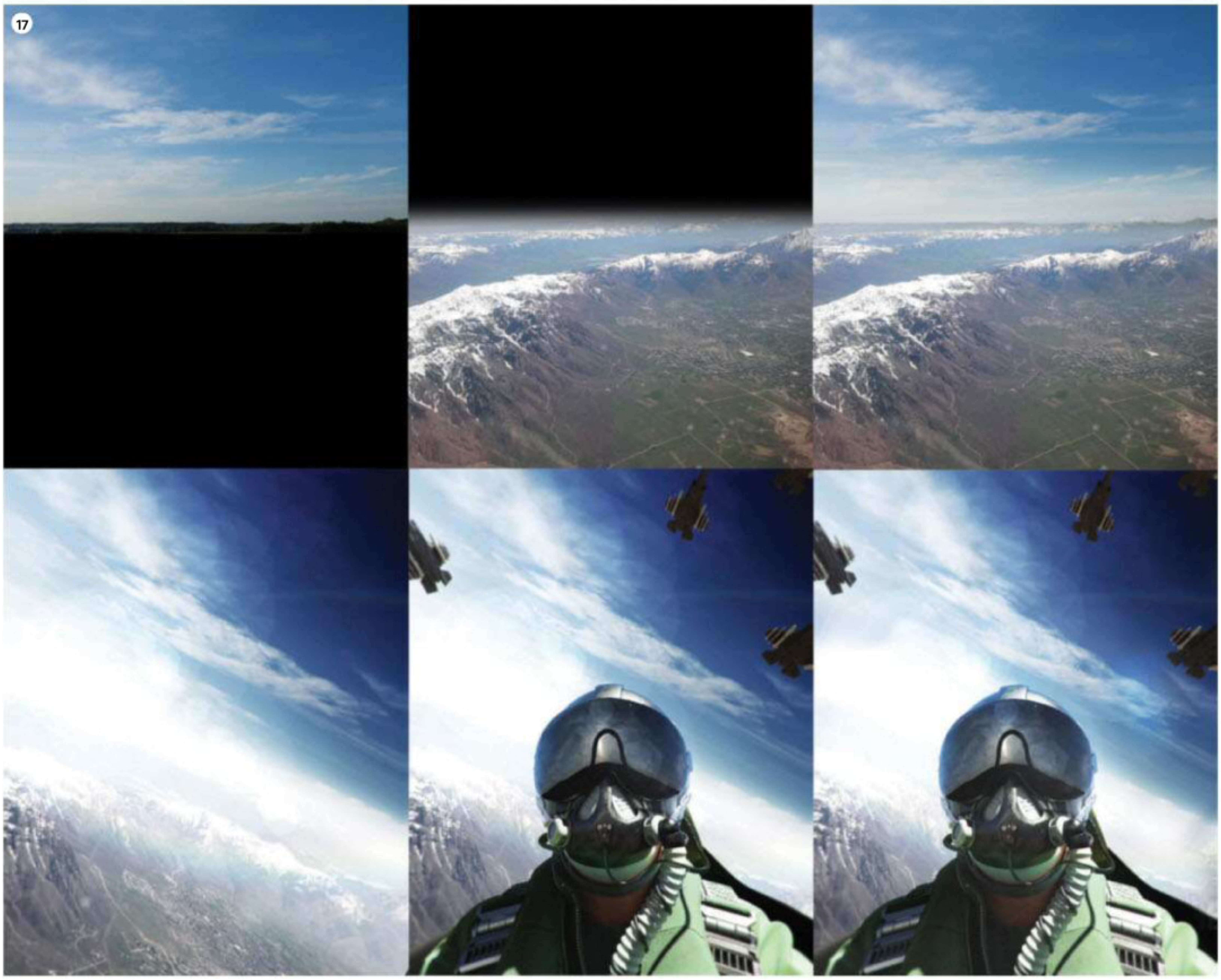
For this tutorial we are going to use sIBL. Go to **www.hdrlabs.com** and download sIBL-GUI and sIBL-Edit. This website has a great library of ready and free-to-use sIBL sets that you can download and use straight away. If you feel that you need to have something that is more custom, you could have a go at using the software to create your own. It has a great video tutorial on the website on how to make these. The beautiful thing about this is that it is pretty much a one-click lightning/rendering setup. Simply load up the downloaded set, select it in the app, choose your rendering engine and hit Send To Software. After that, all you need to do is set up your output resolution and tweak the GI settings. In my own projects, I usually prefer to use Brute Force as GI.

17 Composite

Once the final image has been rendered, we need to create our backdrop image and do some minor colour corrections. Since I couldn't find any aerial images that were good for the purpose of this tutorial I ended up making my own. I used a set of sky backdrops available from **www.cg-source.com** and a few more images of the horizon. I simply overlaid these images and used the Clone Stamp tool to create a transition. To make things more believable, you can add a few wide strokes right where these two meet. Use a light-blue colour with a low Opacity. Once you're done, import your final render and position it right above the created backdrop. You'll want to blend these and make some colour corrections so they feel like one. Add some subtle blur and chromatic aberration on top to make it more realistic. Try to keep things on separate layers and then mask out the areas that you don't want to have these adjustments.

Final thoughts

Slowly build up your render and keep things optimised. I generally prefer rendering patches at high resolution. This way, I get to see all the details in the render. Build up your materials one by one. Open-source HDRIs are a great way of adding reflections to your reflective materials as well as some environment lightning. Take your time and don't rush things. Sleep on it and come back tomorrow to have a fresh look. Don't be afraid to make adjustments in Photoshop – you should look at your renders as raw material that needs to be polished.



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Step by step

Easy-to-follow guides take you from concept to the final render

Mouhsine Adnani

Personal portfolio site www.mouhsine-adnani.com
Location USA
Software used 3ds Max, nDo2, Photoshop, Marmoset Toolbag
Expertise Mouhsine specialises in creating environments and props for games

Create tileable textures for game environments

Sci-Fi Corridor 2014

> Here you will learn how to create tileable textures to build *Mass Effect*-inspired sci-fi environments

Mouhsine Adnani is a senior 3D environment artist, and has been working in the videogame industry for over five years

In this tutorial, I will take you through the major steps required to create a sci-fi environment for next-gen games, using mainly tileable textures. I will only focus on one texture because exactly the same technique applies to the rest of the textures in the scene.

We will be using a technique called flat mapping. For all of the modelling we will be using 3ds Max (though you can use any other 3D package) and Photoshop for texturing. We'll also be using nDo2 and Marmoset Toolbag 2.0 for rendering the scene in real time. The aim of this tutorial is to show you what I consider to be one of the best techniques to create great-looking tileable textures.

Concept

The concept of this scene is mainly inspired by *Mass Effect*. To create it, I looked at a series of screenshots and hopefully came up with something similar to its style.

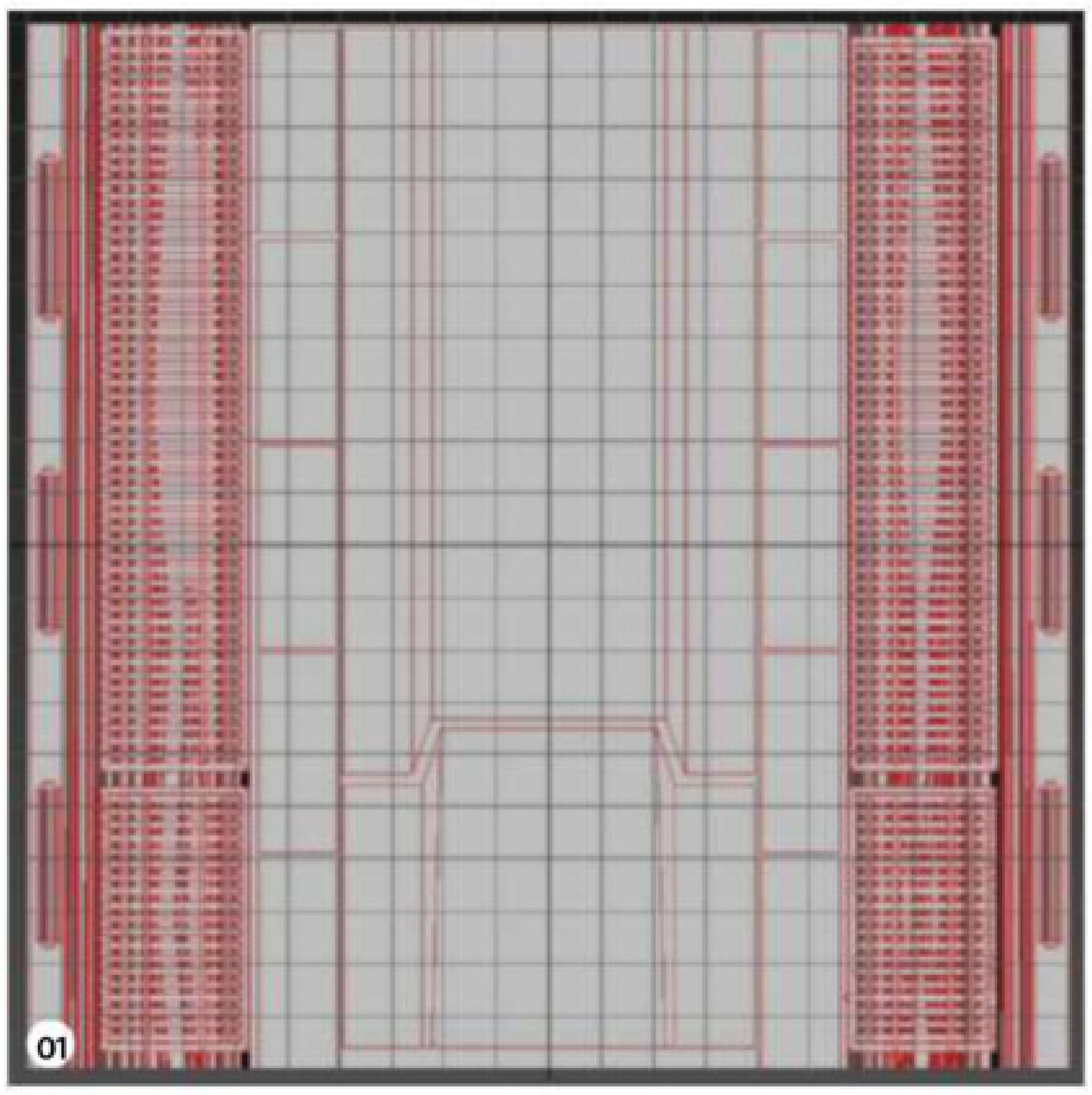
Learn how to

- ☑ Block out a floor for tiling
- ☑ Create a high-poly floor
- ☑ Project the floor to get maps
- ☑ Use nDo2 to speed up your workflow
- ☑ Set up a scene in Marmoset Toolbag

With the Disc

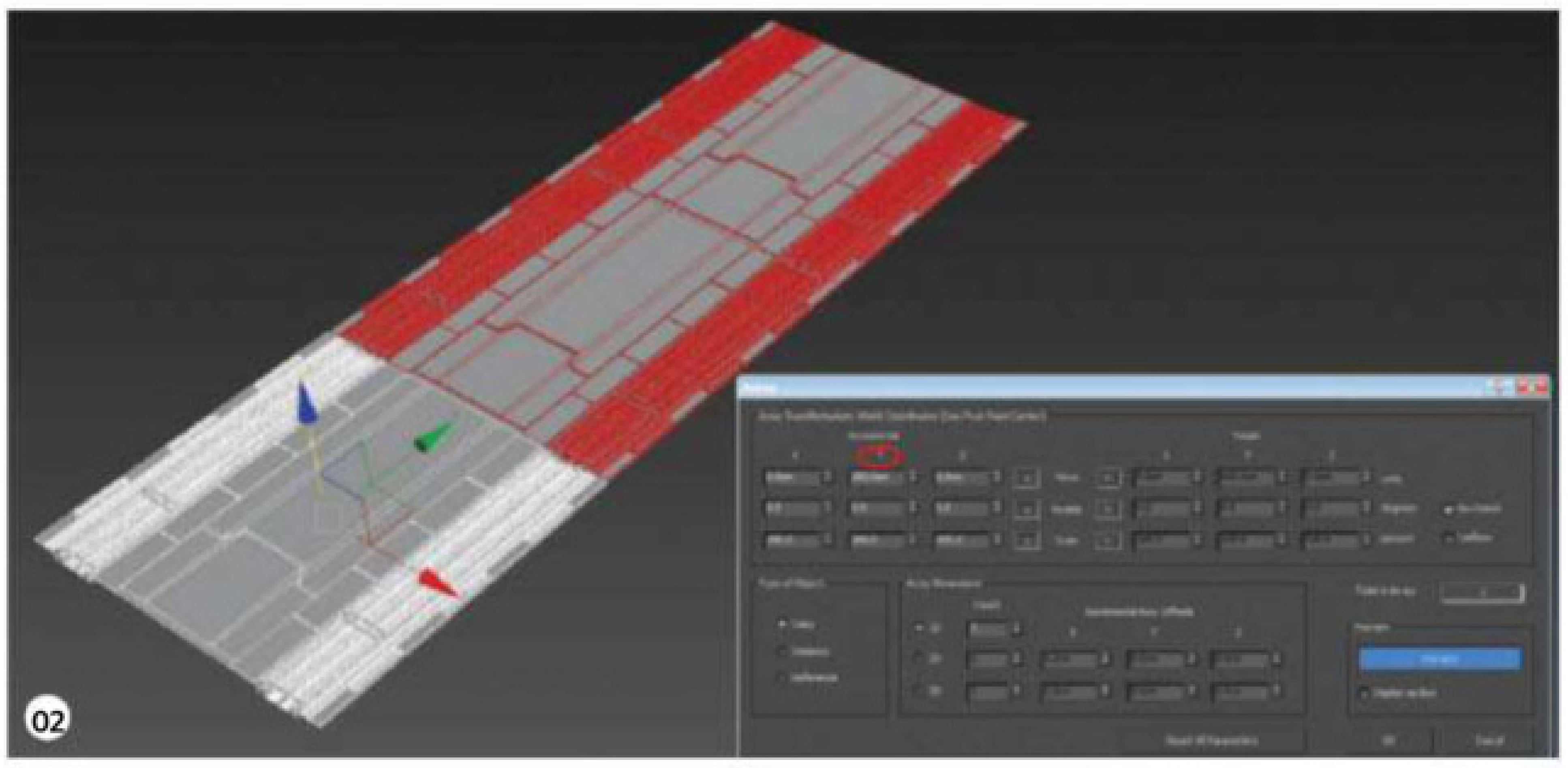
Tutorial files:
- MAX file and textures
- Tutorial screenshots

216-13
07
EAST WING
07
EAST WING
EXIT


01

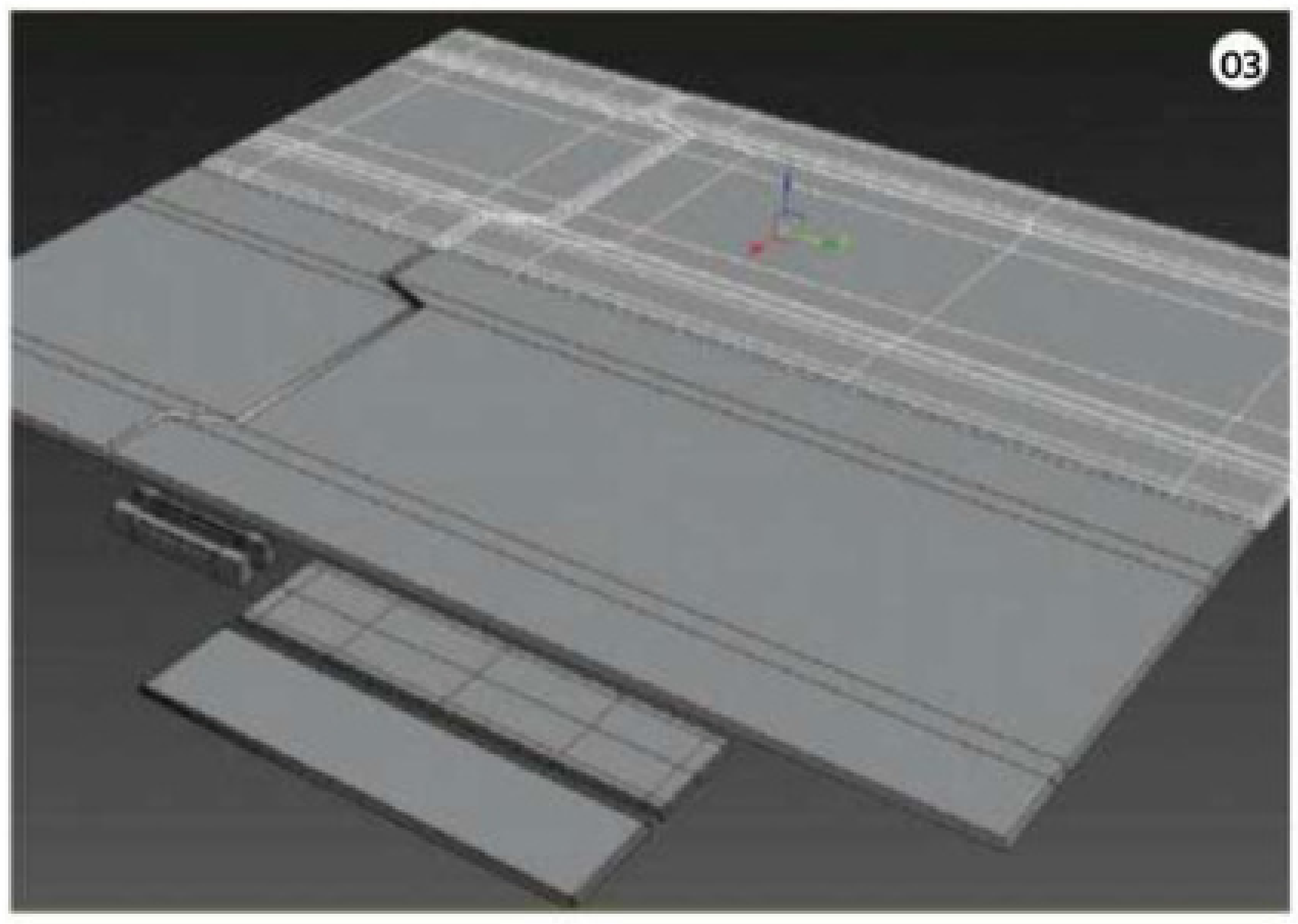
01 Block out and tile

First of all, we'll want to play with some simple shapes until we get something that looks interesting. Make sure your grid is set up to metres – it will make the tiling easier when duplicating meshes to make sure they continue to tile correctly. For my scene, I set the floor to 2m by 2m. Keep everything centred within the grid for symmetry purposes. A model like this can get overwhelming very quickly, so take advantage of using instances and to organise your assets in layers.


02

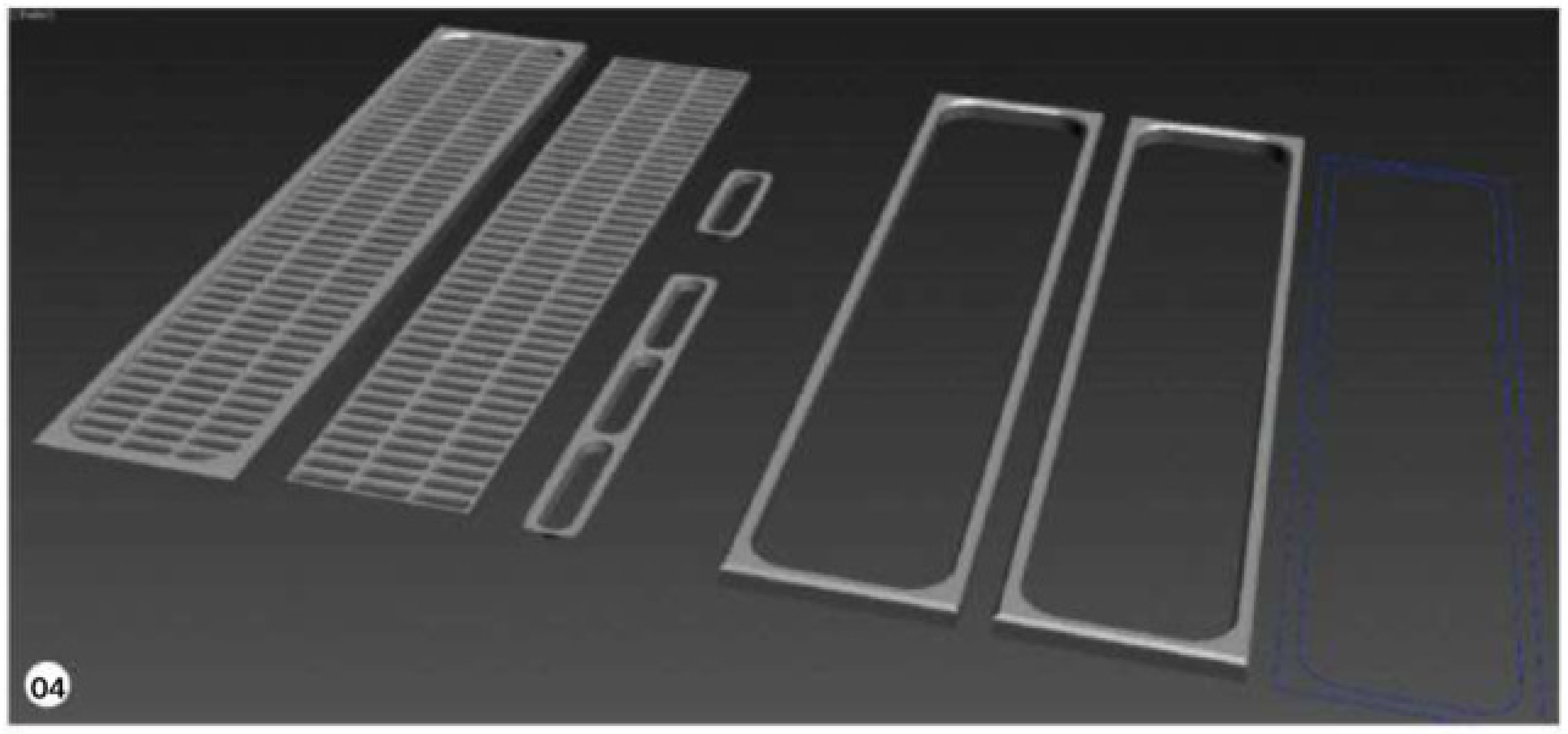
02 Tile

This is an important part of the process, as we need to make sure that the model is lining up correctly. It's absolutely crucial to avoid seams in our bakes. So, using the block out model that we made, we can test out our tiling by duplicating the mesh. Try using the Array tool in 3ds Max – it's very precise and enables you to change the settings in real time (so long as you remember to hit Preview).


03

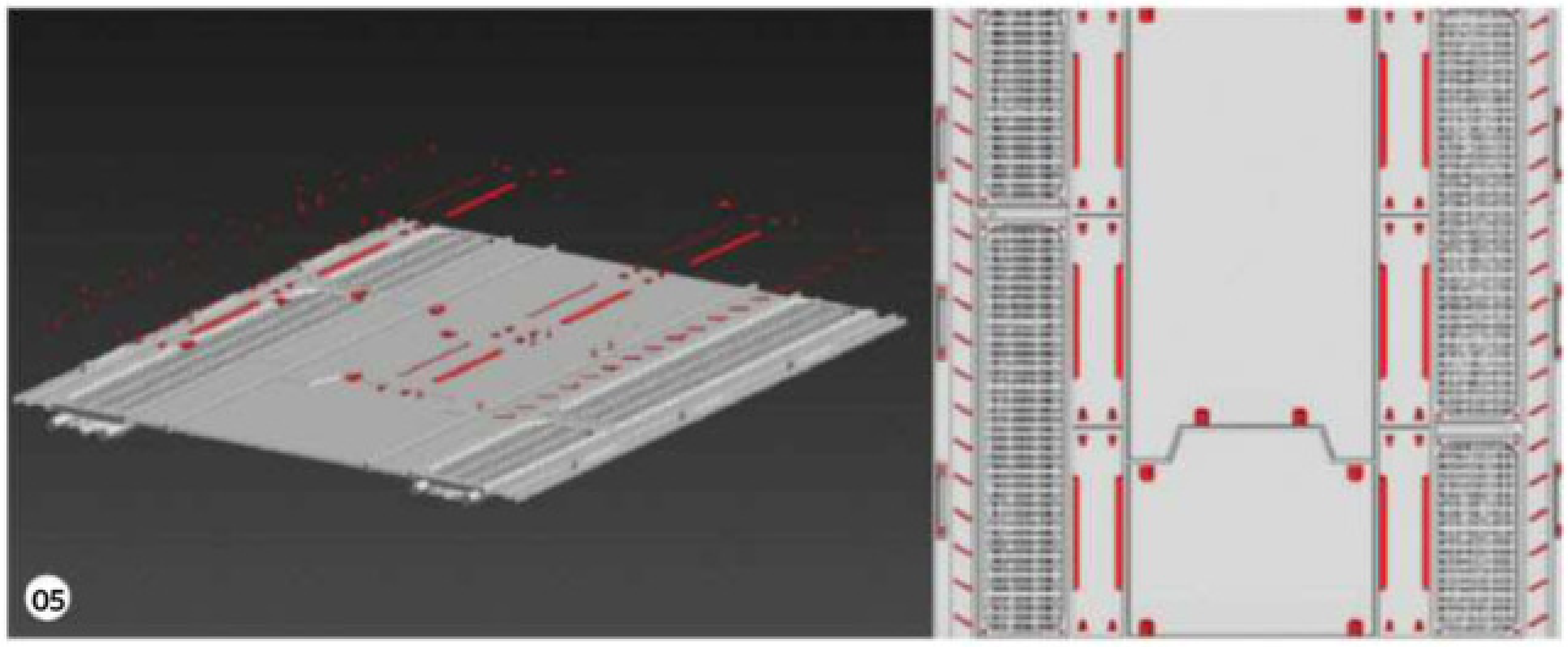
03 Model the high-poly panels and lights

This part of the process is all simple box modelling. It may be easier to take a piece of your block-out geometry, redefine the shape so it looks the way you want it to, reset the Xform on it, then add an Edit Poly modifier on top. Rename it Edge Support and add edge support wherever necessary. Swift Loop is your best friend in this step because it will make the process go faster. Apply a TurboSmooth modifier on top and voila. You can always go back and tweak the low-poly mesh and it shouldn't break your model as long as it's not a huge change. Alternatively, you can just delete your Edge Support modifier and start over.


04

04 Model the grate, pipes and cables

The easiest and fastest way to create a grate is to use the extended splines in 3ds Max. Here, we'll be using WRectangle, which provides control over both the outer and the inner radius. Throw a Bevel modifier on top of this and then chamfer the edges for better definition. For the holes, start with a cylinder, delete the top and bottom, extrude the upper edges, add edge control and then duplicate it. Pipes and cables are just simple cylinders with some details.

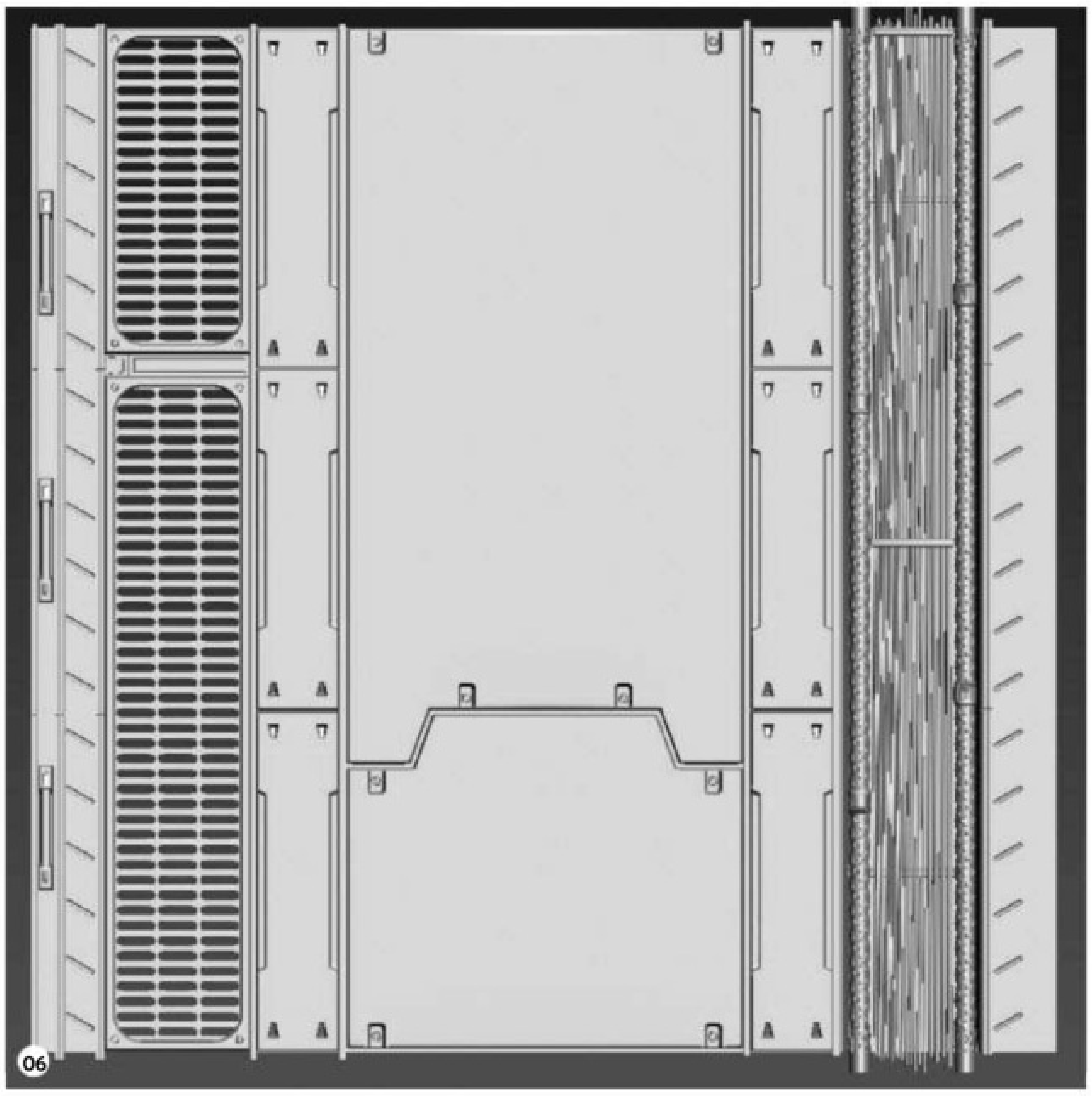

05

05 Add floating geometry for details

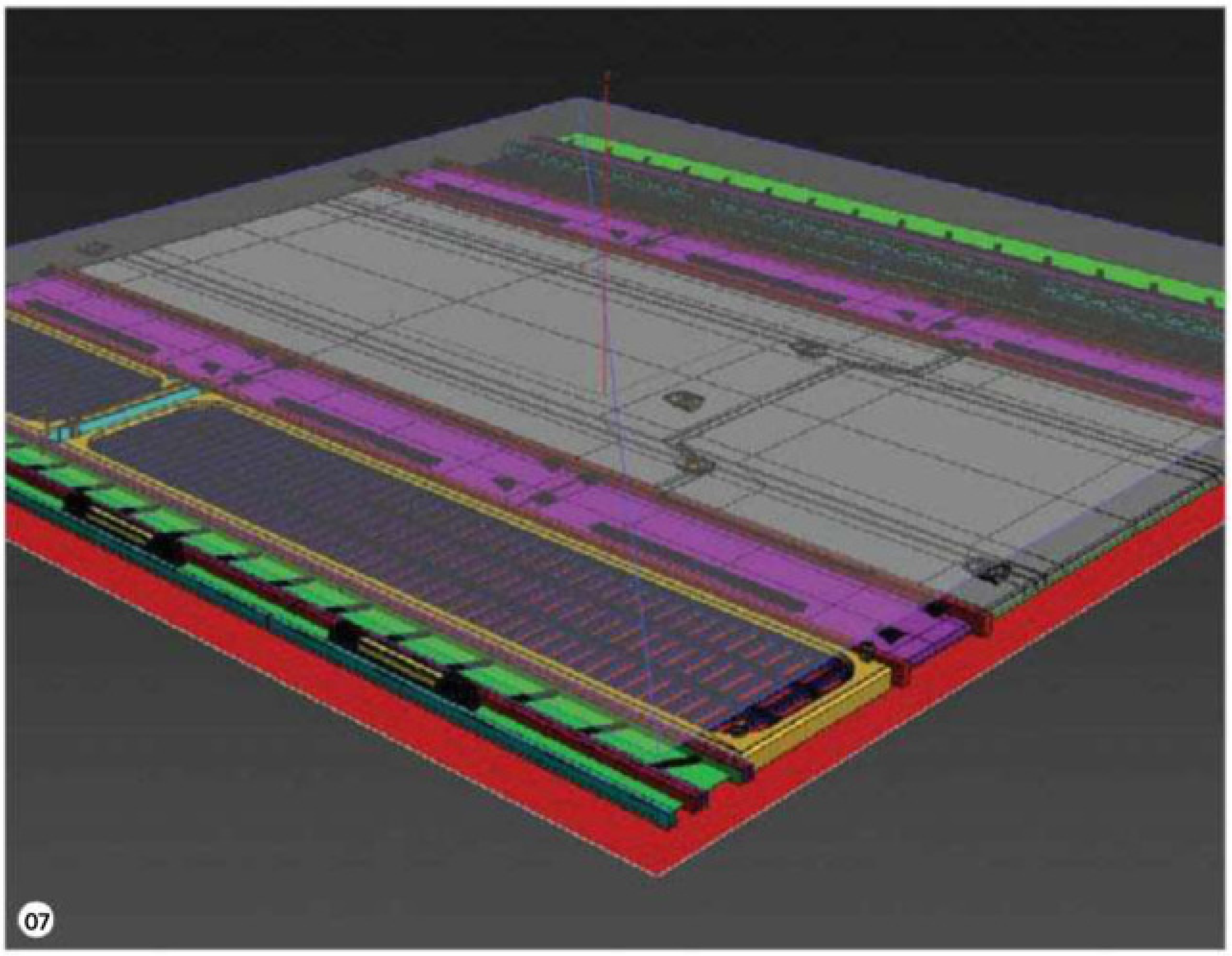
In this step we're going to add a bunch of little details to the floor. My preferred method is to do so by adding floating geometry on top of the floor that's already been created. Enabling these details to float makes is very easy to try a variety of looks, and to add or remove details without ever having to commit to one look (so long as it looks good from a top-down view). It's a non-destructible workflow and if you're working on a whole environment you can easily use those same details in other textures to obtain a much more cohesive look to the scene.

Floating geometry pro tip

Make sure that the Normals on the borders of the floating geometry are all on the same smoothing as the Normals on the mesh underneath it, and that the face or polys are all at the same angle so that when it's baked, it looks like one mesh. If not, you will see a seam on your Normal map, which will interrupt the consistency of the tiles.



06 Set up the floor for baking Since we want the grate to show what is underneath it without looking flat, we are going to have the grate on one side of the texture, while the other side will show the cables and wires that run underneath it. This way, we will have to map it accordingly when doing the low-poly mesh of the floor. Doing it like this means we are also optimising the texture space.



07 Project on a simple plane An important step before we do the projection is to apply different colours to each part on the high-poly, such as screws, panels, cables and so on. Making a projection plane of 2m by 2m will match the size of the grid we started with. Apply a Projection modifier to the plane, pick all of the objects that make up the high-poly floor and make sure the cage covers everything, including the floating geometry.

Artist Showcase

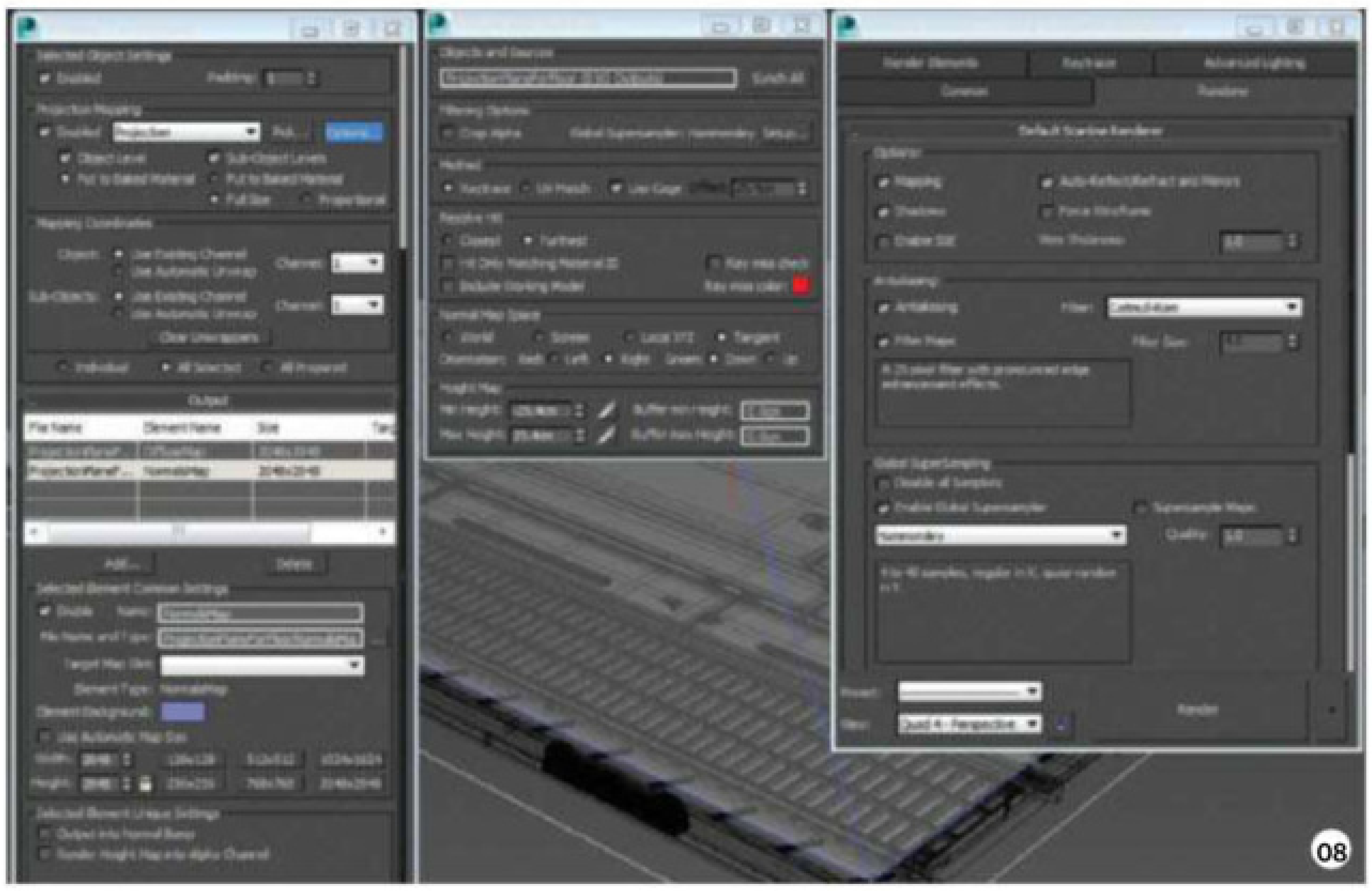
Mouhsine Adnani

I'm a senior 3D environment artist who has been working in the game industry for over five years. I've worked on titles such as *Star Wars: The Old Republic* and *Warframe*. I love the limitless freedom that creating 3D art offers.

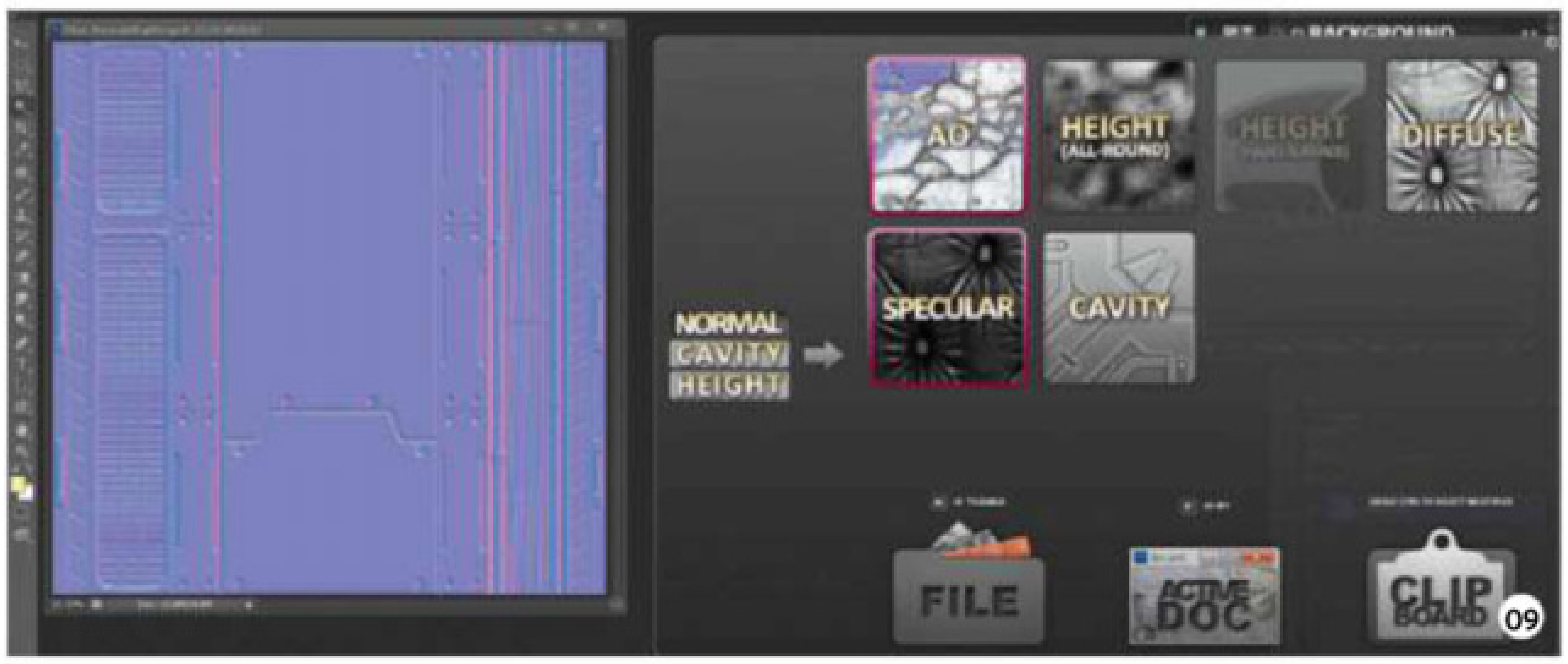
Moroccan Door **3ds Max, ZBrush, Marmoset, Photoshop (2013)**
I've always been fascinated by the complexity of Islamic art, and I thought I'd give it a try.

Medieval Door **3ds Max, ZBrush, Marmoset, Photoshop (2013)**
I made this door to improve my ZBrush skills. I looked at different references of medieval doors and made my own.

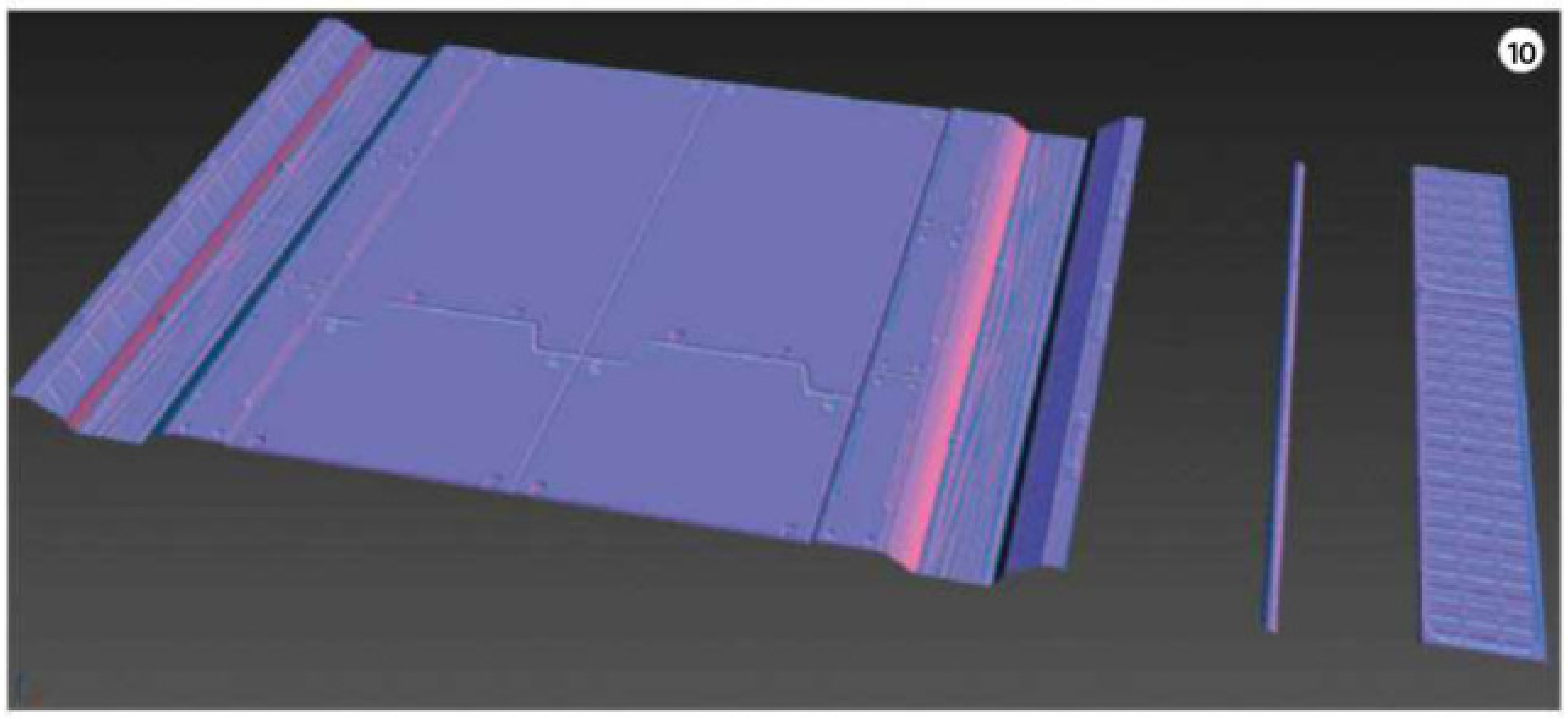
Shipping Container **3ds Max, ZBrush, Marmoset, Photoshop (2013)**
The shipping container was made as part of an exercise on hard-surface modelling and also to try out dDo.



08 Render to texture Using Render To Texture (press O), make sure that Projection Mapping is enabled. Under Options, make sure the Global Supersampler's filter is on Catmull-Rom and Supersampler is on Hammersley and set the quality to 1.0. Head back to output in the RTT window, add a Normal map and Diffuse map and make sure they are both enabled. We should also give them a target folder and name where they will be saved. For this example I've set the size to 2048 by 2048, but you can go higher if you want. Save as TGA 32-bit. Hit Render and let it do its magic.



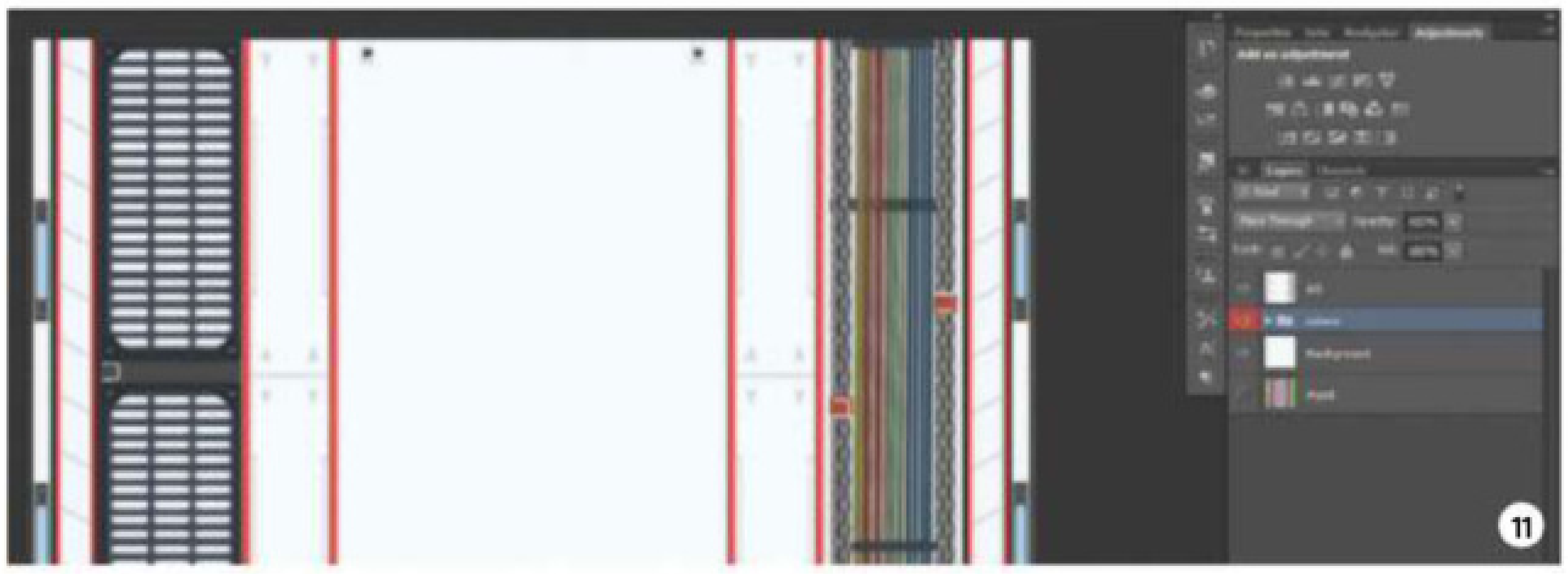
09 Use nDo2 for Ambient Occlusion and Spec Working with nDo2 is pretty straightforward. First of all, open the Normal map that we created in 3ds Max in Photoshop, then open nDo2 and click on Convert and pick AO and Specular. Make sure that the Tileable box is checked. Now click on Active Doc and let nDo2 run the process. You can tweak the settings of your map further by using the Options that pop up with each map.



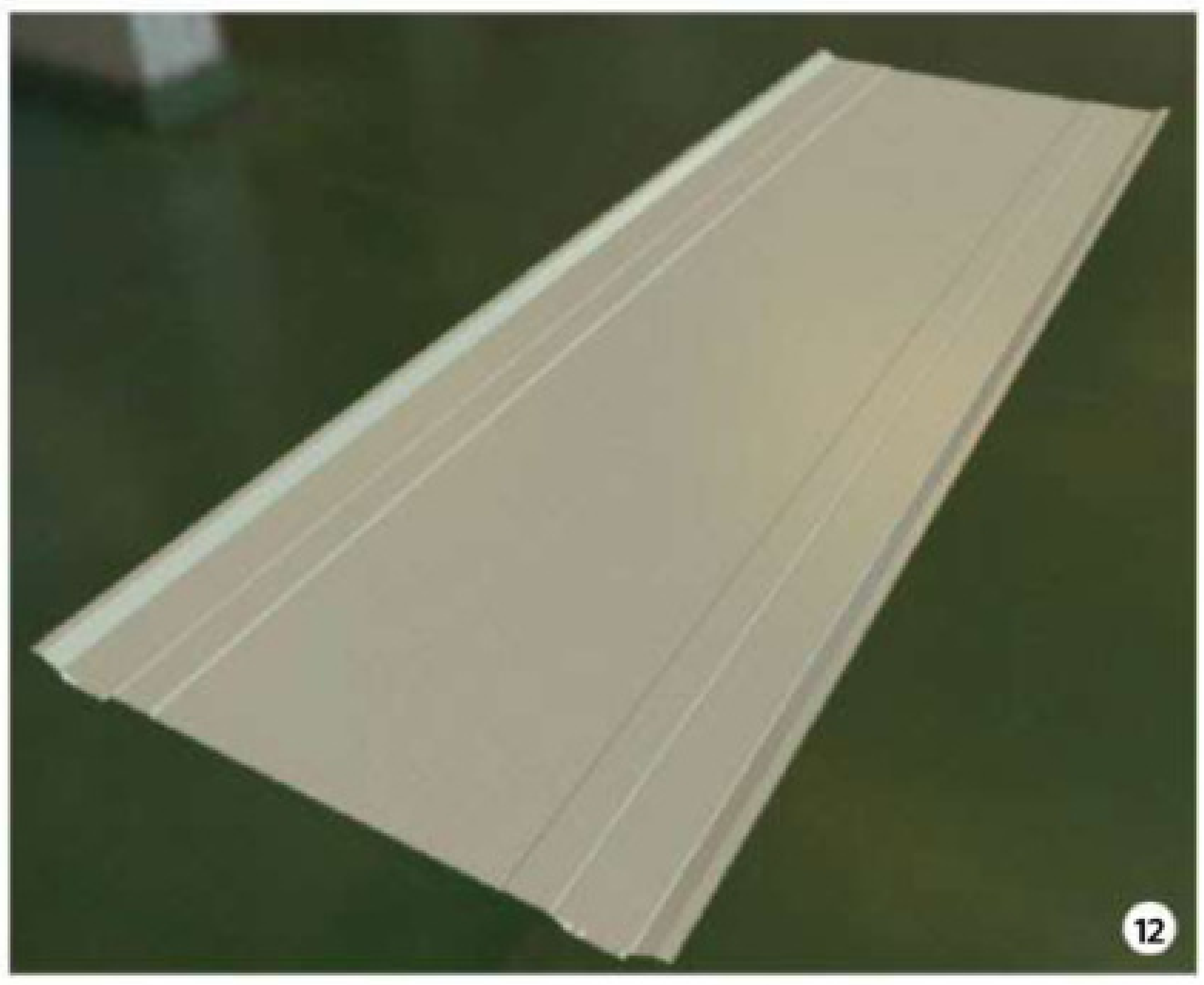
10 Make the low-poly floor Apply the Normal map we made to a simple plane in 3ds Max and add some edges where the textures have natural trims to define the floor a bit. Map the cables and wires to the other side of the floor as well, since we only made one of them. Detach the polygon where the grate is, give it edges on the sides and then duplicate it. You can then move it to the other side of the floor. Make the floor wider by duplicating the big middle panels, then map the thick cables on half of a tube to give them more shape.

Model for Normal maps

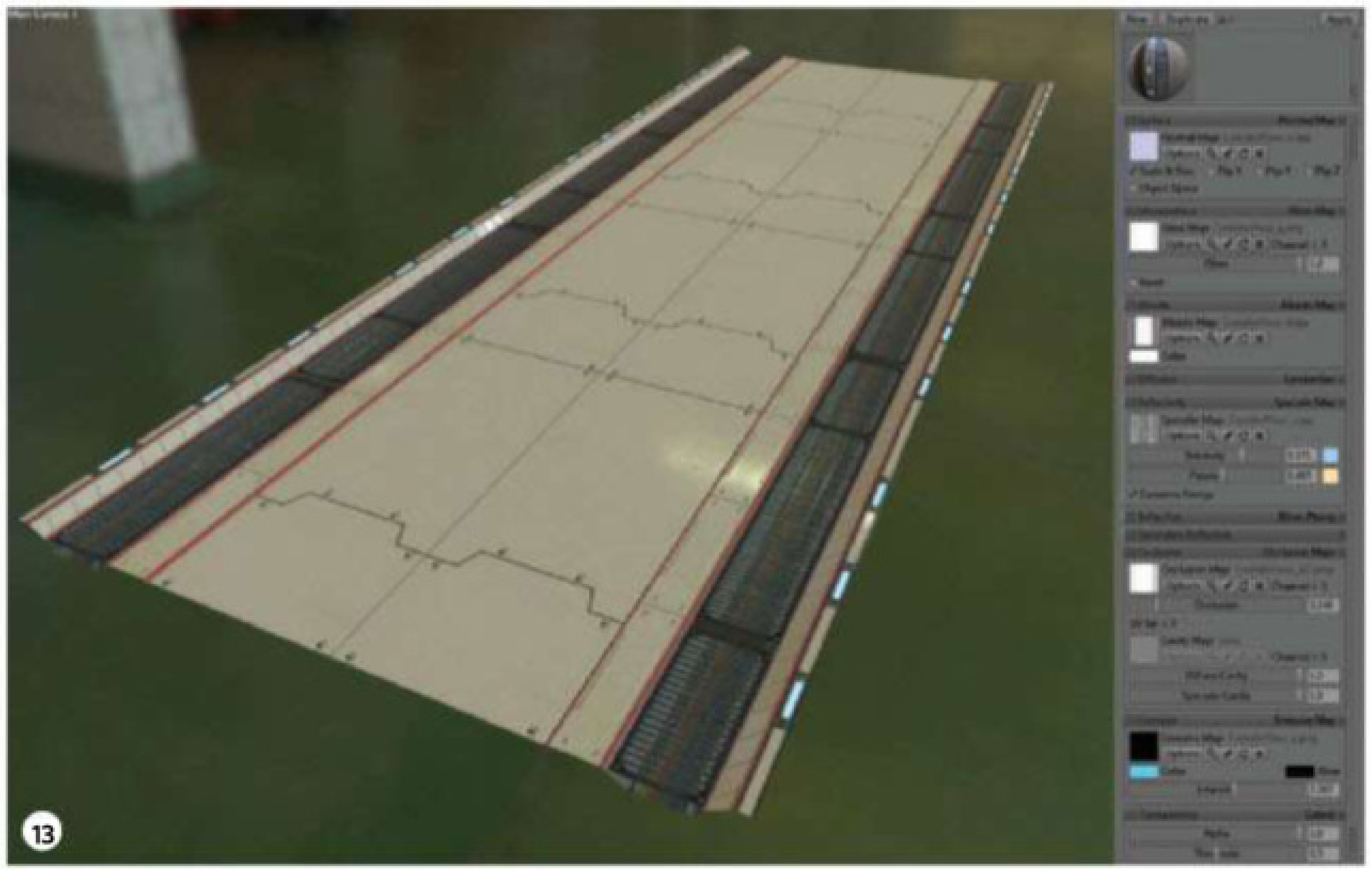
When working on your high-poly model, keep in mind this is being created to mainly extract a Normal map. Exaggerate the shapes a bit so they can read better when they are baked, and try not to have any 90-degree angles on your extrusions. You should slope them because when you project on it, you will get a flat-looking Normal map.



11 Texture in Photoshop Now that we have all the maps, let's put them all together in Photoshop. Put the AO map on Multiply (20% or less) and use the mask to make your selections. Apply colours to the panels, screws and all the other parts of the floor. This might take a little time to find a good balance of colours – for this, I recommend testing the texture in 3ds Max to see how it's tiling and that nothing feels too obvious when it repeats. You can also add subtle edge scratches on the panels and grate where people would be walking on it.



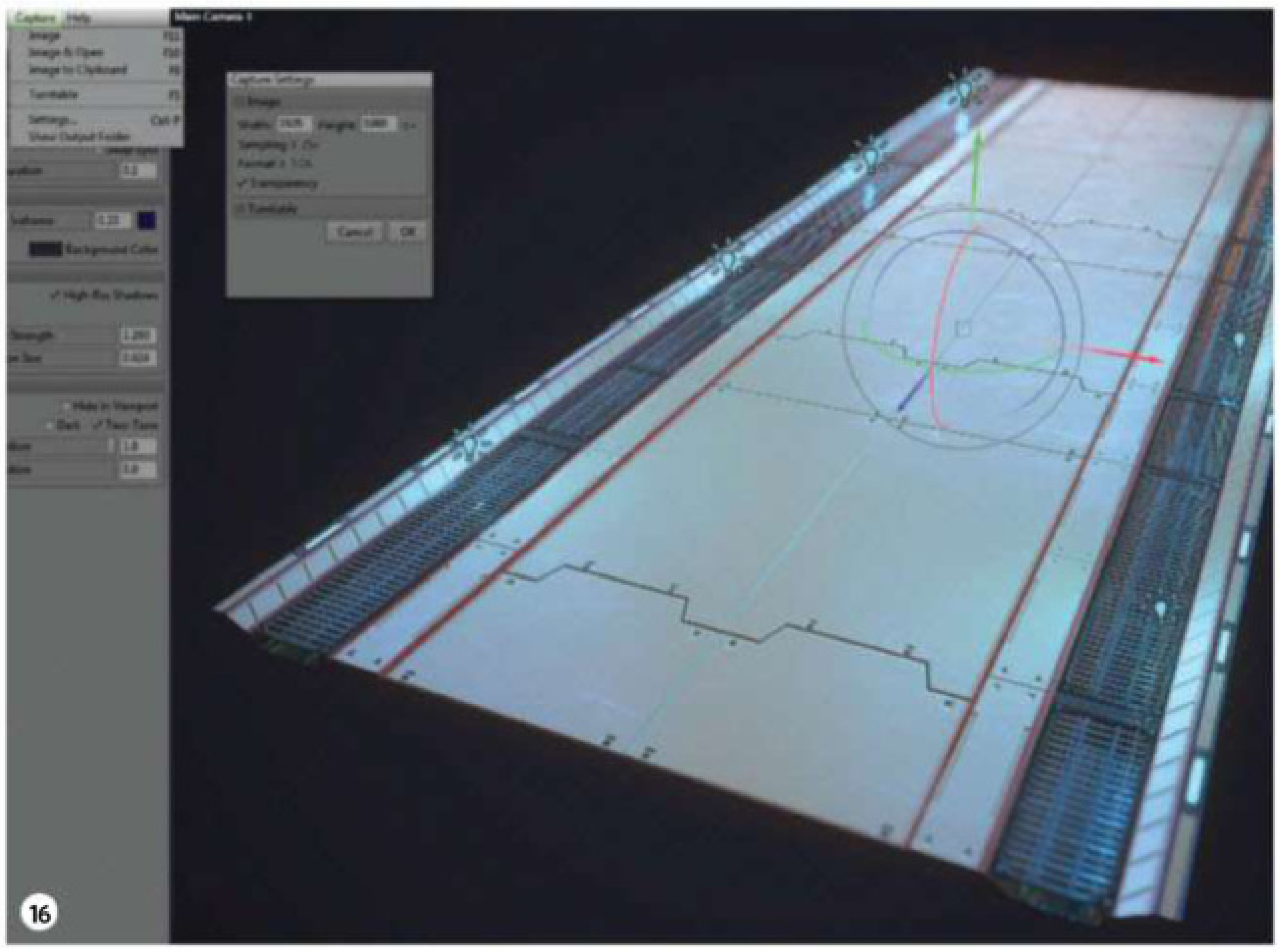
12 Import meshes Marmoset Toolbag 2.0 is a powerful program that will definitely make your art shine. First, we are going to import our floor mesh from 3ds Max. Use the Add Mesh control (Cmd/Ctrl+B) to import the floor. Marmoset reads OBJ, FBX and other file formats, so you should be able to import your work. The model should now pop in the viewer, and you will also see it under the Scene tab. You can select it from here and explore more options for it.



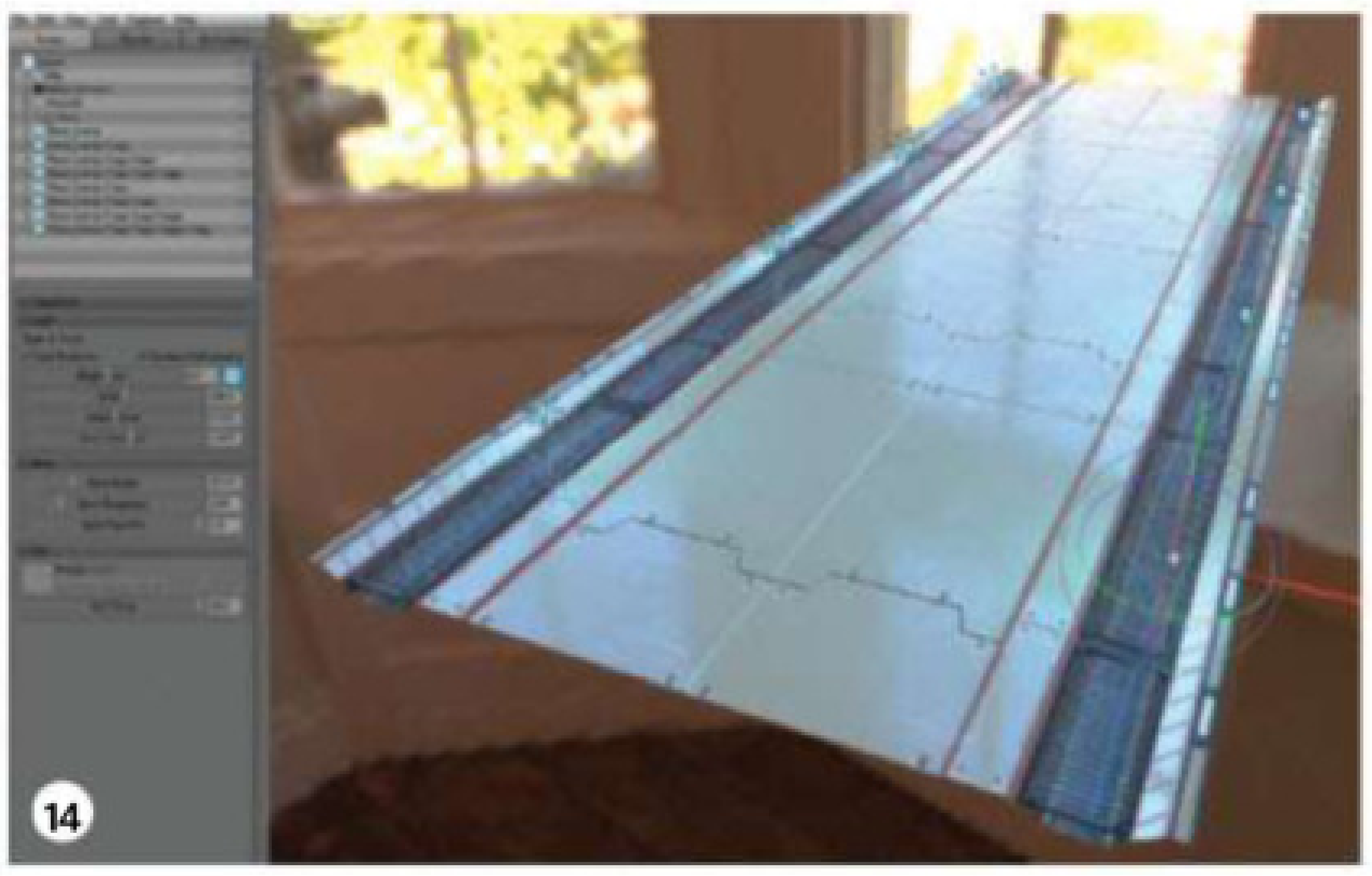
13 Create a material Making a material in Marmoset is very intuitive. Albedo is used now instead of Diffuse because it is a more accurate term when working with PBR. Plug in all the maps in their corresponding slots. Your Albedo map should mainly contain colour information and there is a slot for AO that will give you control over your AO map in Marmoset, but don't forget to add your Emissive map. For your Alpha to work, under Transparency select Cutout. That should do the trick.

Spec, Gloss and Emissive maps

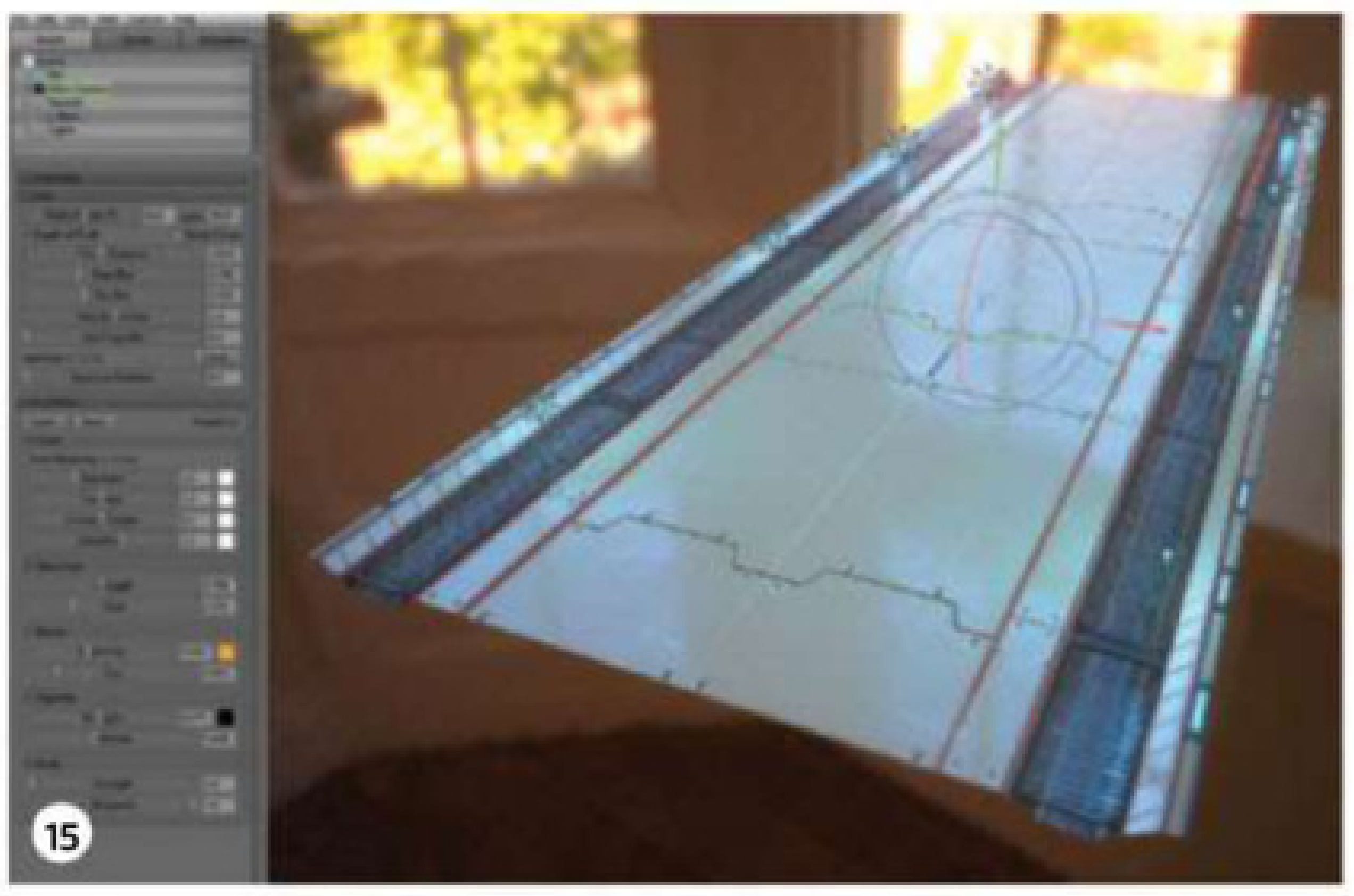
To take advantage of the physically-based rendering (PBR) in Marmoset, spend some time tweaking your Spec and Gloss maps. The end result will definitely be worth it. If you have created edge scratches and other details, make sure you add them to include them appropriately in your scene. Your Emissive map should be black and white – its colour can be changed on the fly in Marmoset.



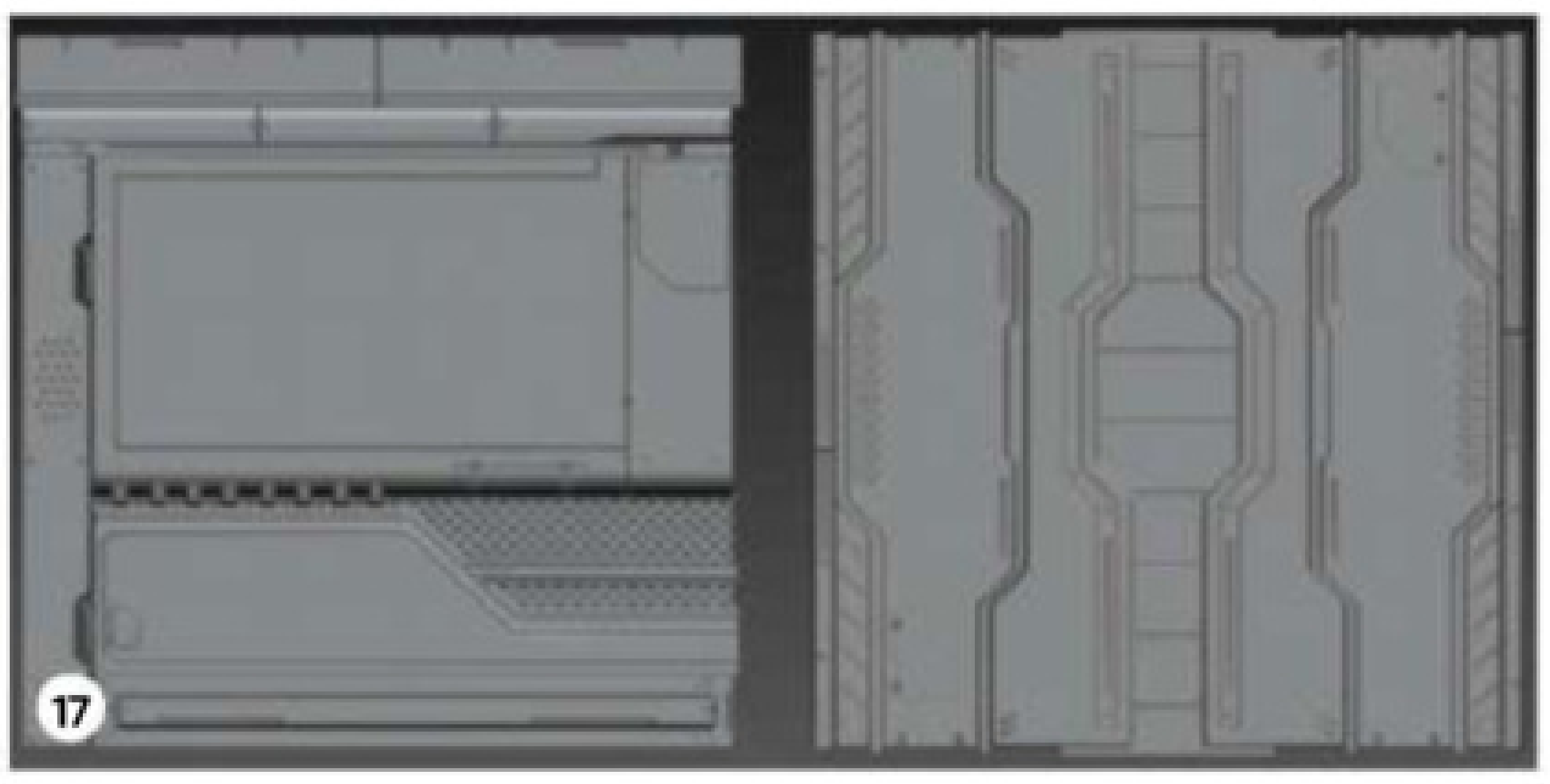
16 Render Under the Render tab, disable the Sky background and pick a desaturated blue background. Enable Local Reflections, Ambient Occlusion and High-res Shadows. If you notice that Marmoset is getting less responsive then, under Viewport, bring down the resolution to Half and the Anti-aliasing to None. Now we are ready to render, but before this, go to Edit and under Preferences pick an output for your image. Go to Capture>Settings (or press Cmd/Ctrl+P) and pick a Size for your image. Crank the Sampling to 25x and enable Transparency if you want an Alpha for your final image. Press OK then hit F10!



14 Sky and lights Under the Scene tab, click on the Sky and this will give you the option to pick different presets. For this scene, opt for Museum because it works well with the shader we've set up. Go to Add>Point Light or press Cmd/Ctrl+L and name it Floor Lamp. Move it and place it by one of the emissive floor lamps (one light per three floor lamps). Give it a blue tint, check on Cast Shadow and tweak its value until you get something that looks good. Pressing Cmd/Ctrl+D while the light is selected will duplicate it so that it can be spread around.



15 Post and Camera Effect Post and Camera Effect are two settings under the Main Camera in the Scene tab. Enable Depth Of Field and tweak the Focus Distance with the near and far blur to give your scene some depth. In the Post Effect, give it a bit more Saturation, crank up the Sharpness, and add some Bloom and a subtle vignette effect. Drag the Grain all the way to 0. Press the space bar to go full screen and to gain a better view of all the effects you've applied.



17 Potential of this workflow Using this process, I went ahead and made the wall and ceiling of a small environment. I also made a Decal map to add signs and logos to break up the textures a bit. Notice that you can make different assets with these textures – for example, you can remove one of the grates, detach some of the panels and so on. Try to tell a story with your environment and your scene will come together easier than you think.

• DID YOU KNOW? • All tutorial files can also be downloaded from: www.3dartistonline.com/files

Technique focus

Incredible 3D artists take us behind their artwork

LIGHTING This piece is based on a concept by Ishmaev Sergey. My goal was to push the story even further with the lighting. I used a warm area light in the lower right to emphasise the gossip, while a cold spotlight in the top-left with a gobo window texture suggests the light is shining through a window of a religious building. The window divisions helped to separate the characters. **Funeral,** 2014

Leticia Reinaldo

Website www.leticiareinaldo.com
Country USA
Software used ZBrush, Maya, V-Ray, Photoshop
Bio Leticia is a Brazilian character artist who enjoys work that evokes emotion from the viewer

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Stefano Tsai

3DArtist online

Username: StefanoTsai

Personal portfolio site www.stefanotsai.idv.tw

Country UK

Software used 3ds Max, V-Ray

Expertise Stefano specialises in visual mechanical design, robot design and 3D previsualisation

Build fantasy vehicles in 3ds Max

Fantasy Ship 2014

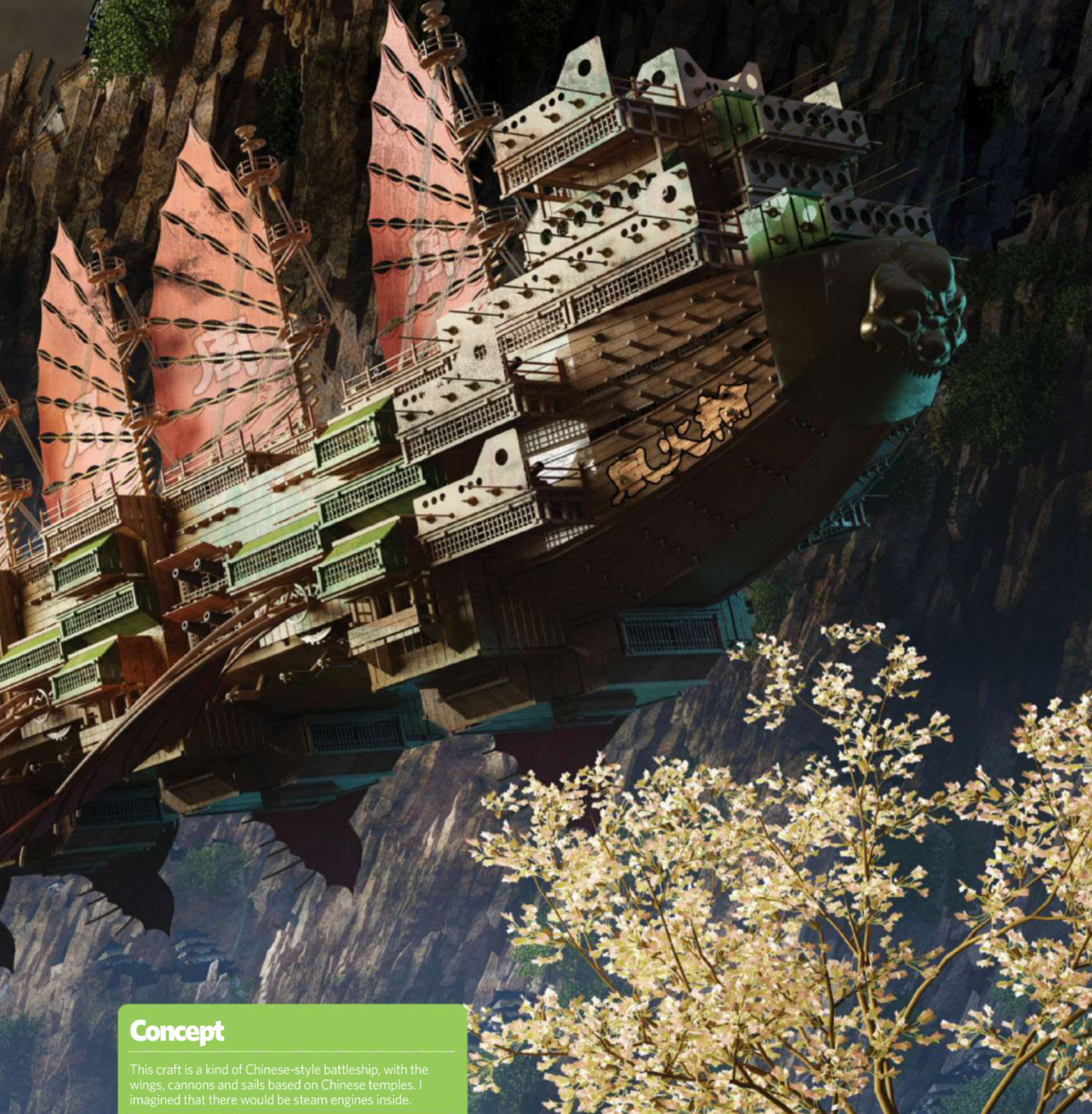
“Learn from engineers and find a quicker and more efficient way to build a fantasy vehicle”

Stefano Tsai is the owner of Stefano Tsai studios. He works in game and film design, creating concepts and working on the actual production process

In this tutorial, I am going to show you how to quickly model a large-scale fantasy ship. The first step involves thinking like an engineer, looking for efficient ways to build the ship. Next, we'll focus on modelling. For this, I will explain how to get the initial parts built, then how to use them as an example for the rest of ship. This will include not only its structure and style, but how it connects with neighbouring sections. Remember to follow along using the project files provided to get the most out of this tutorial!

Learn how to

- ☑ Understand what elements are important when designing fantasy vehicles
- ☑ Develop a knowledge of how the structure works
- ☑ Block out the main elements
- ☑ Model with better efficiency and speed



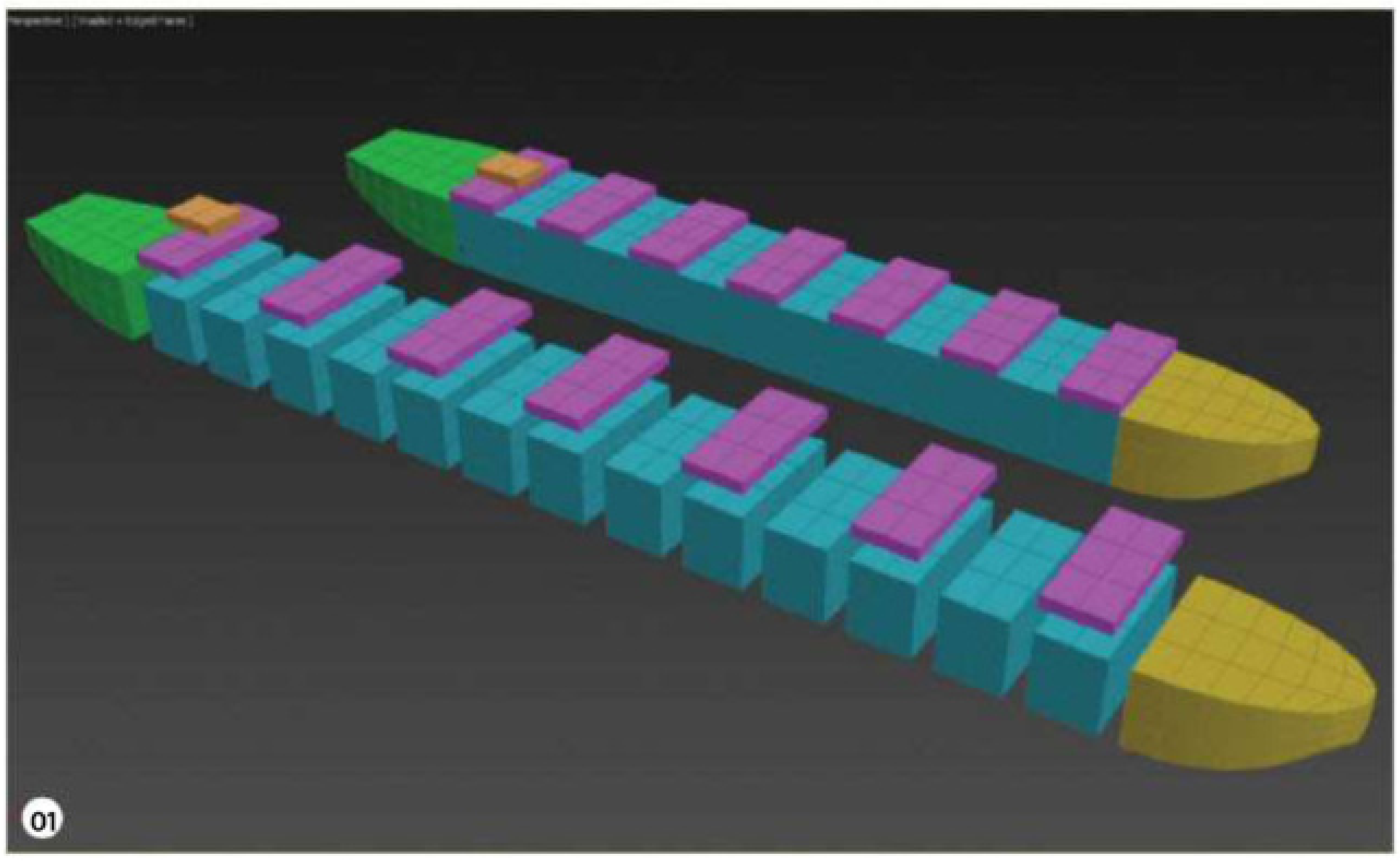
Concept

This craft is a kind of Chinese-style battleship, with the wings, cannons and sails based on Chinese temples. I imagined that there would be steam engines inside.

With the Disc

Tutorial files:

- 3ds Max scene files
- Tutorial screenshots

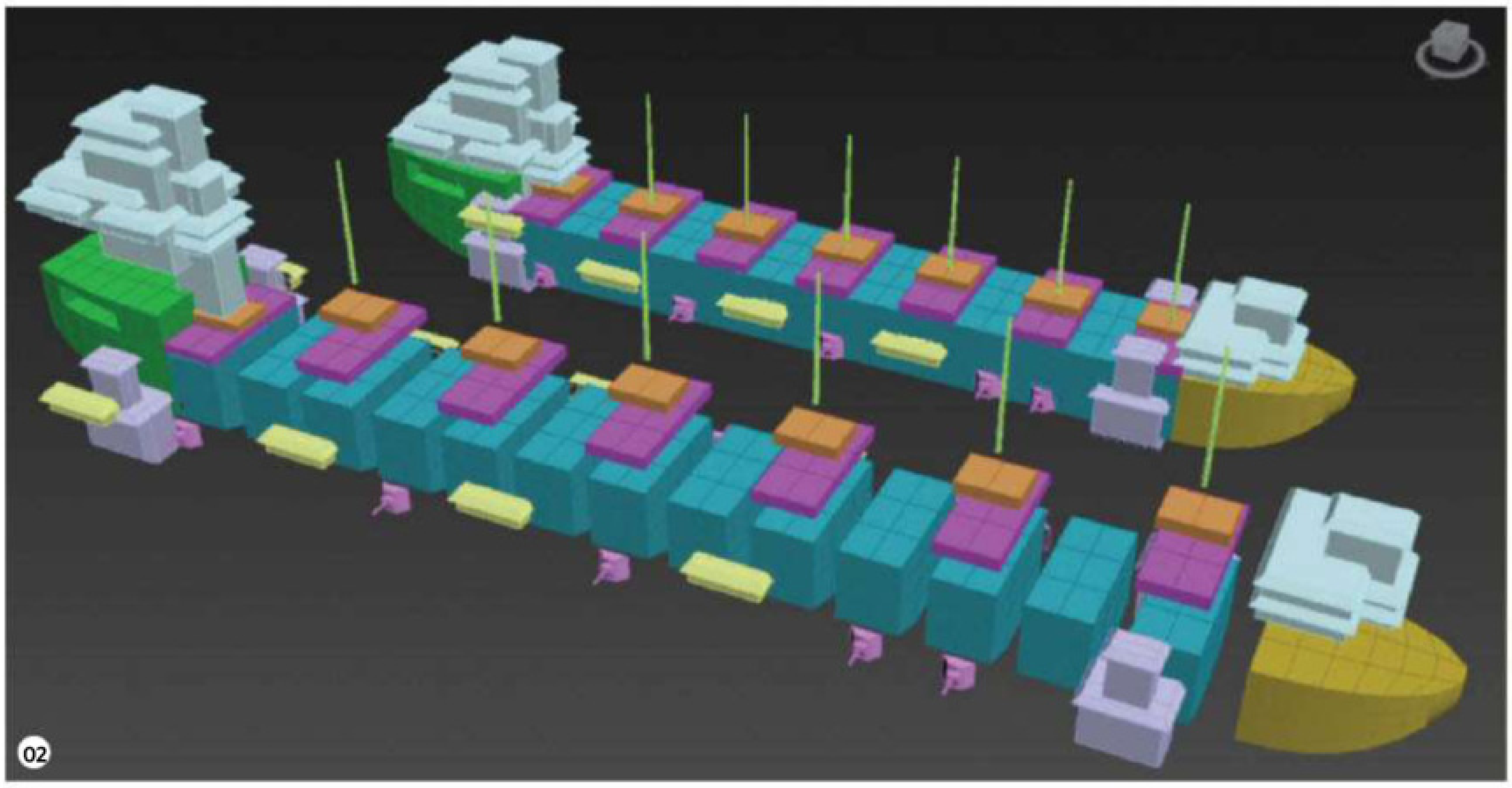


01 Be efficient

Be efficient Split off the ship's main hull and think like an engineer – how can we build this ship? If you think of building the ship as one big project then it'll end up seeming like a lot of work and it'll be difficult to make any changes. We should keep it as simple as possible. Section off different parts of the ship into different groups and – as you can see from the image – models with the same colour are instanced, so you have full power to change them with minimum effort. Don't build the whole ship in one go, but build the parts separately.

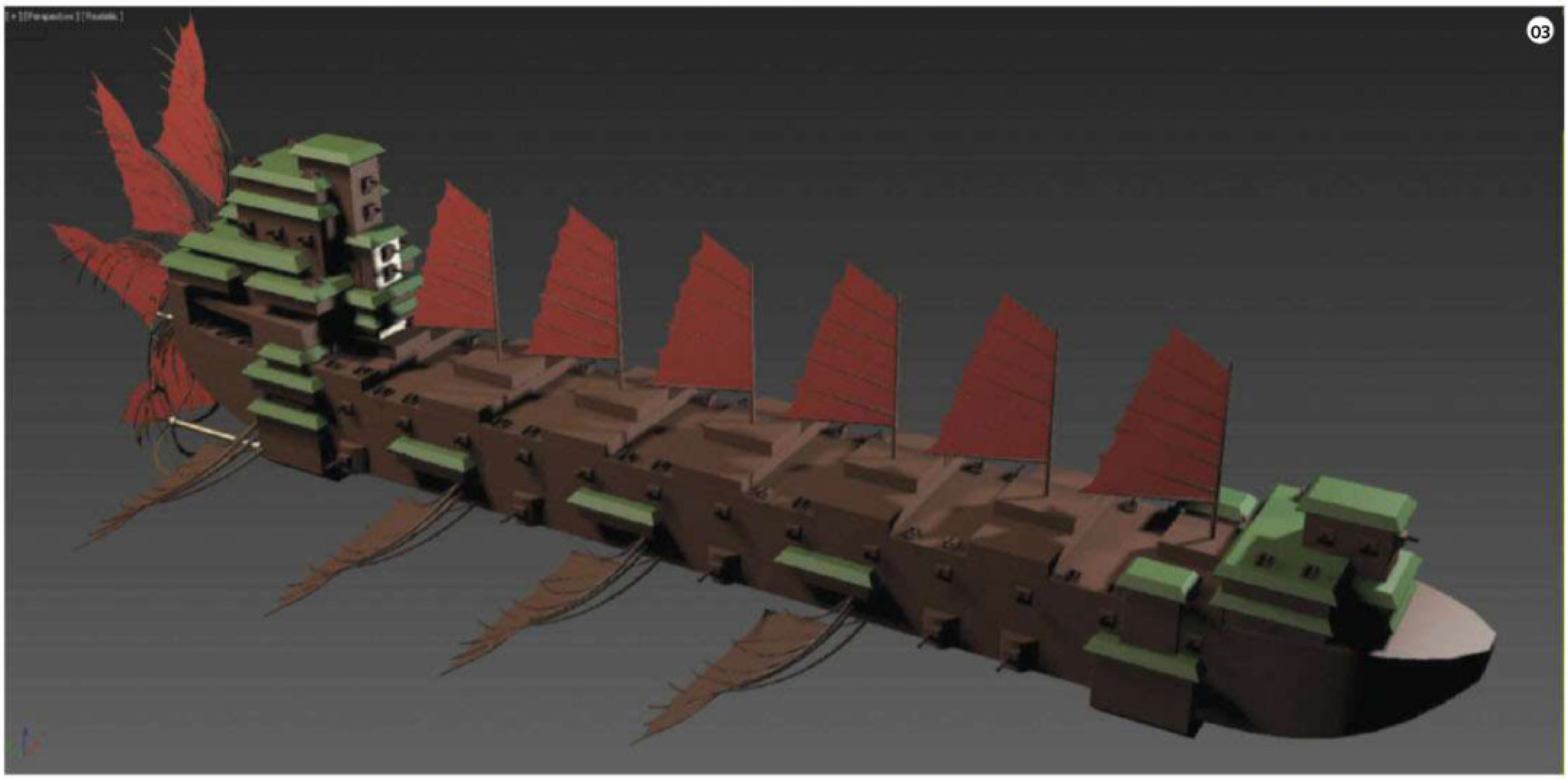
02 Block out the main areas

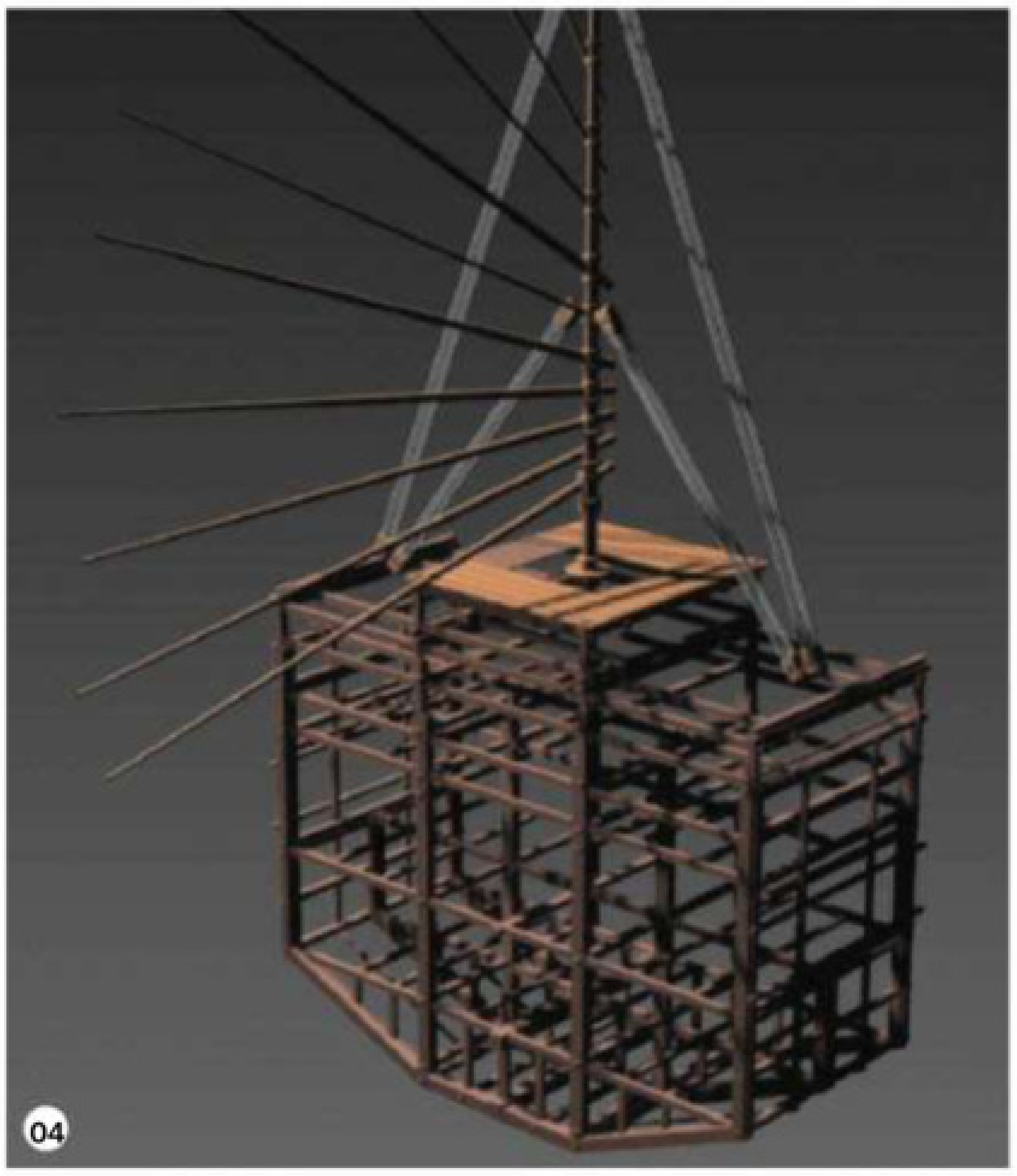
Block out the main areas Add the secondary blocking details on the hull and apply different colours to help differentiate each group. In my project, I added the main bridges, master poles, extended the structure and added cannons. To make the process simpler, reuse assets as much as you can. For example, the purple blocks in the image are all the same asset. Extend the secondary blocking on the main hull and like before, reuse the same models as much as possible.



03 Include wings

Include wings For our fantasy ship, there is no way that it would work without wings. It is the element that really makes this stand out as fantasy. Don't make them too big or too realistic, but try to keep them looking quite fantastical. Be careful not to make them too large, otherwise they will dominate the ship and cover the main hull, which will ruin the overall effect (unless you're designing a fast vessel). Switch into Clay mode to see the ship in one solid colour, as this way we can see the entire model clearly without obstructions.

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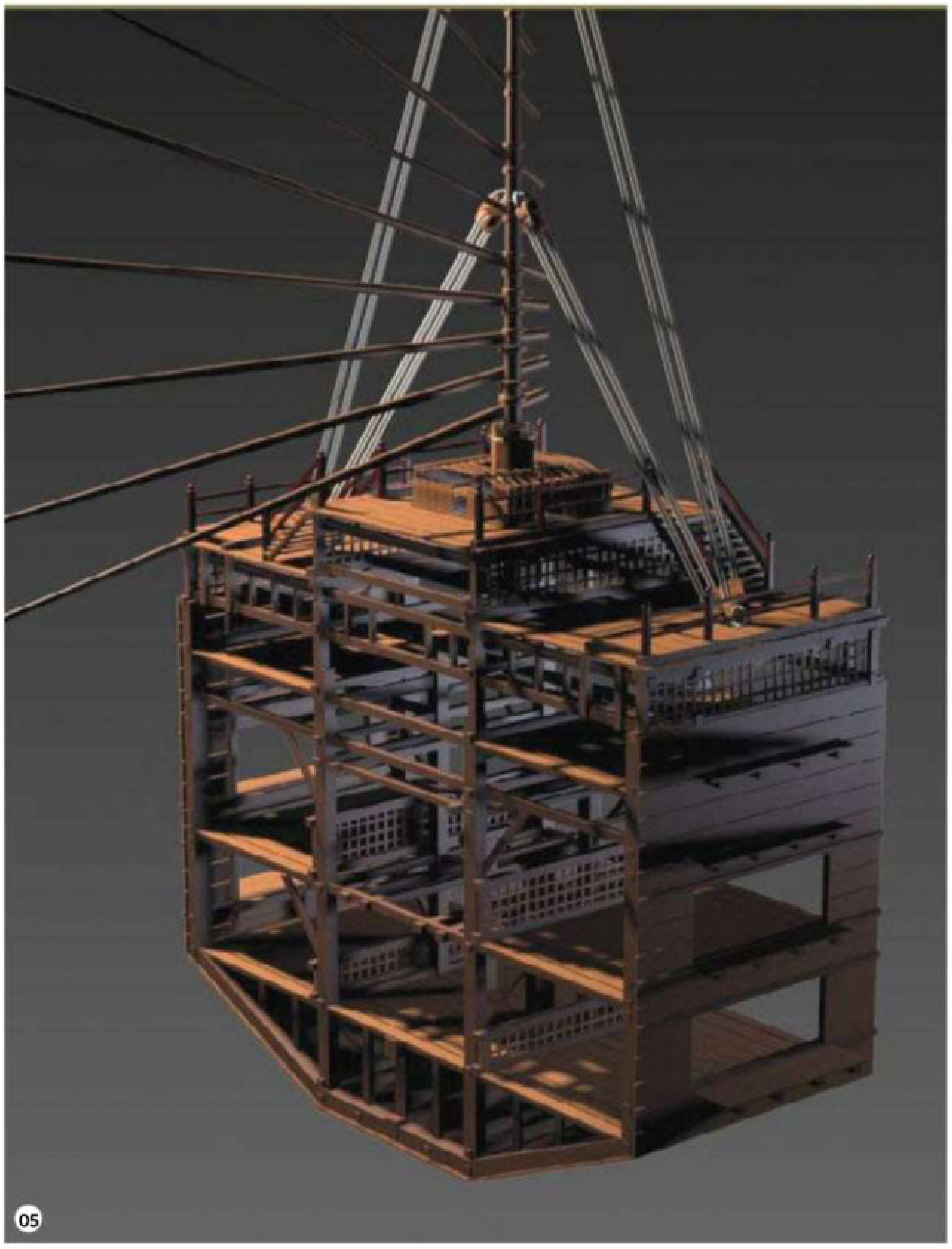
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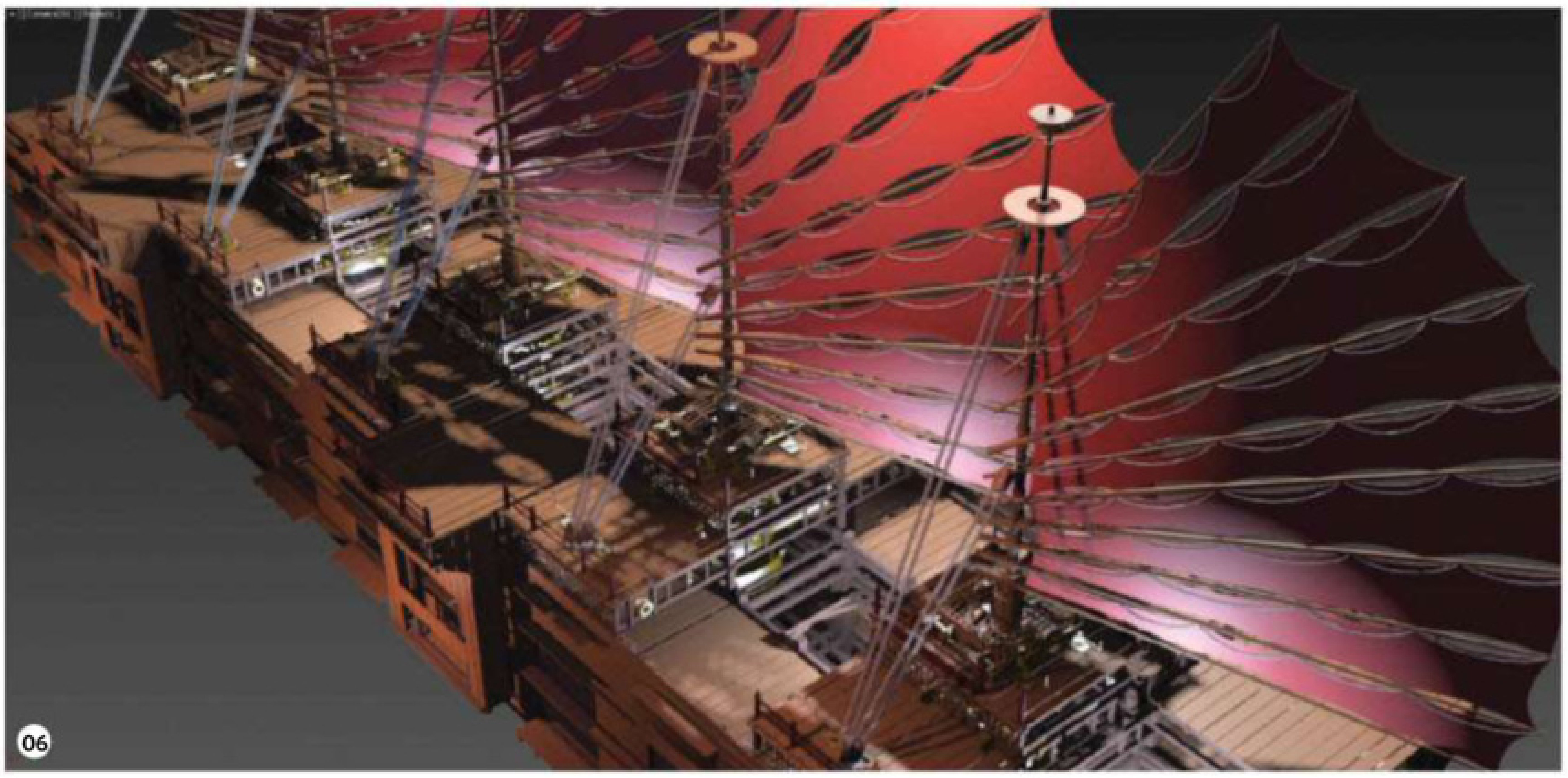
04 Build wooden structural frames To make things more believable and to have something to show later on when we open up the panels, let's build up a structure inside the middle section of the hull's blocking. We need to consider where exactly the decks are going to be and where we're going to place the windows and extended platforms, so this means we need to leave them some space. Thinking things through like this will emphasise the believability of our fantasy ship.

Learn to recycle and reuse elements of your work

To save time and speed up progress, remember that you can take elements that you have already used and place them in other parts of the ship. You can simply resize or reshape them and they'll feel completely new . For instance, the middle section of the hull was repeated and re-used most as its structure can be easily extended to other parts of the ship. For the interior of the ship, cannons, steam engines, platforms and so on can all be easily copied and placed around where you feel they make most sense.

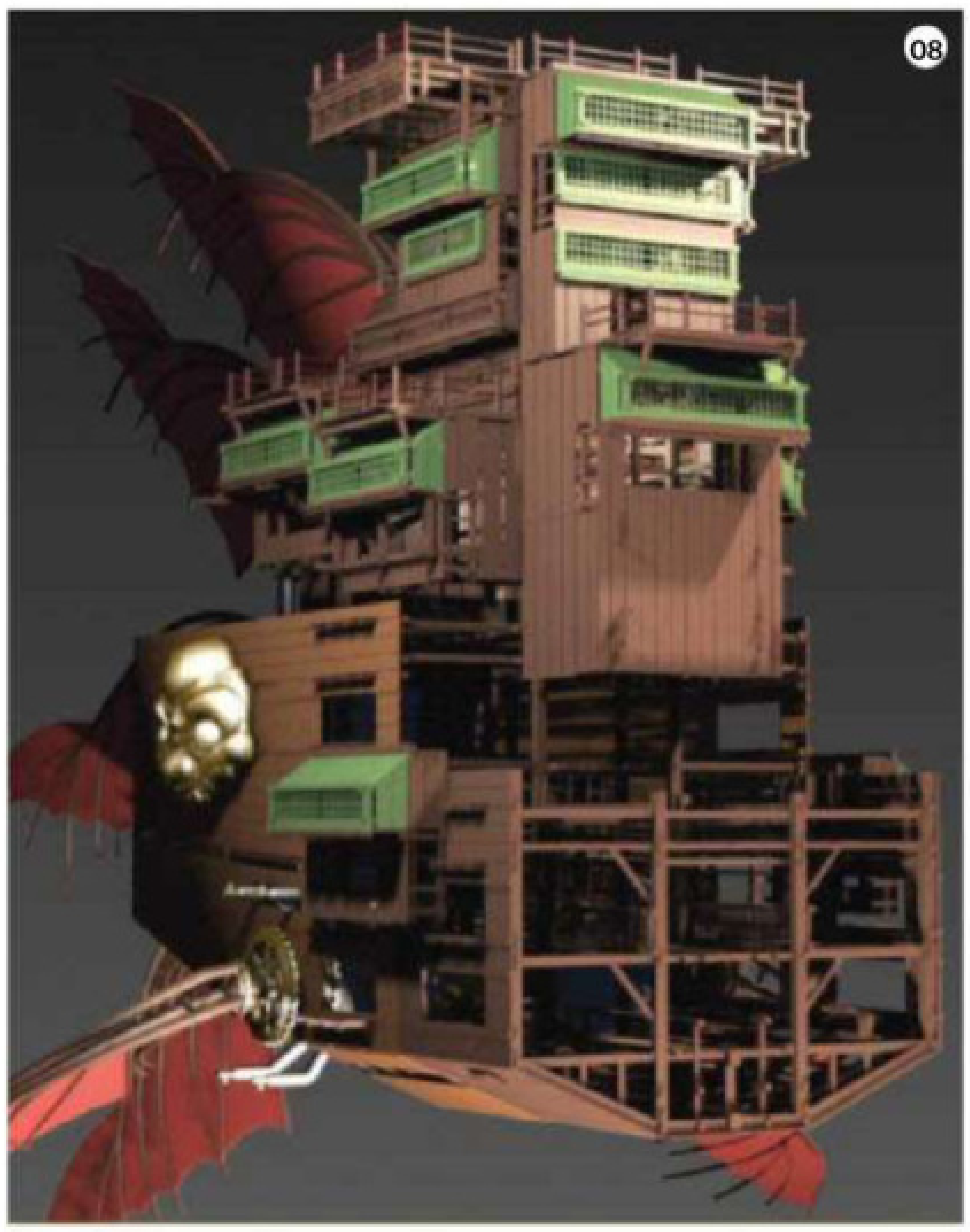
05 Place the planks on the ships With the main wooden beams and posts ready, let's start placing planks along them. Remember that these sections need to be tiled, so they can't be overlapped – everything has be to placed inside their boundaries. We can also add stairs and some windows frames to bring in the sense of scale. It's details like these that really emphasise the sheer size of the ship. The bigger it is, the more imposing and impressive!

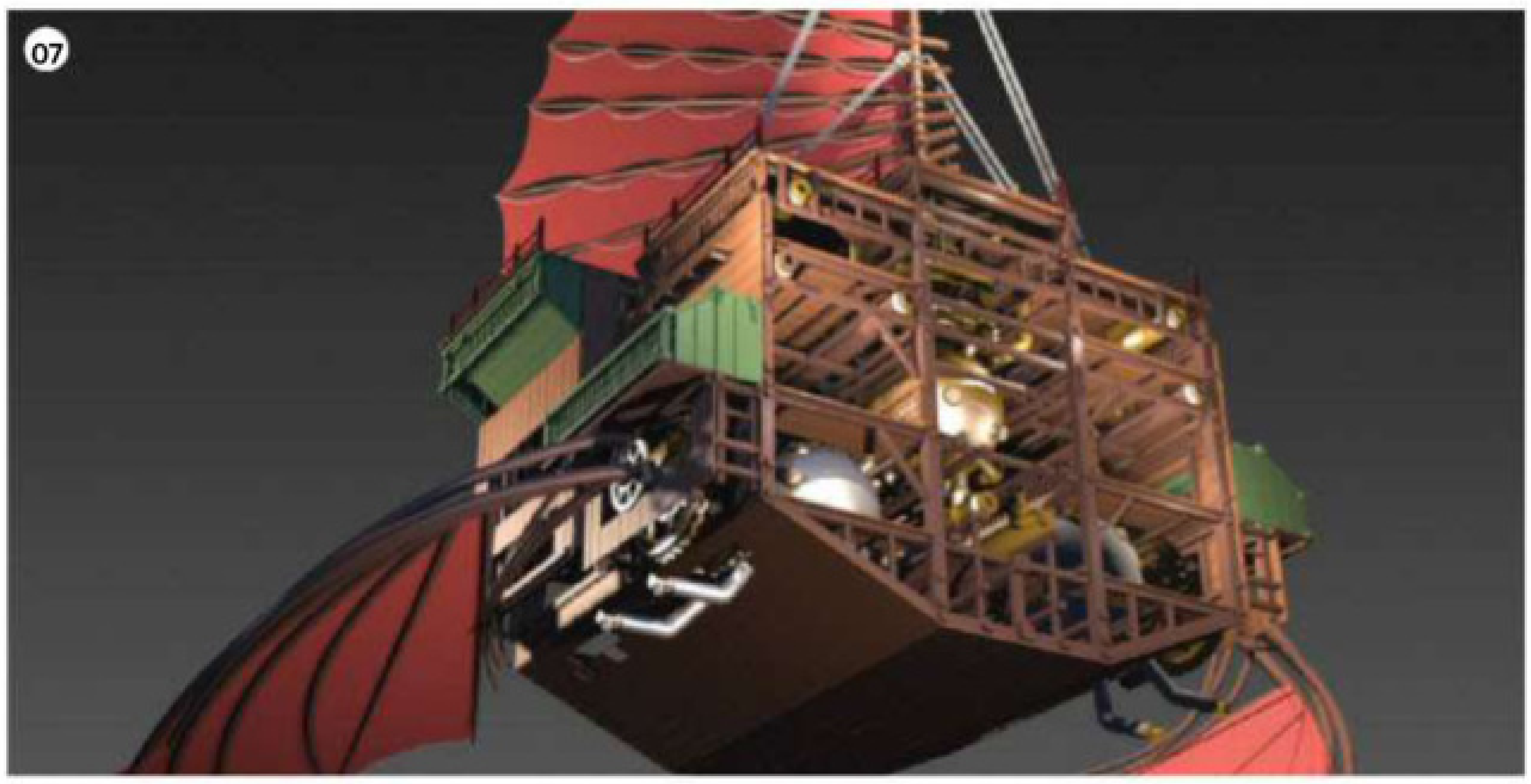
06 Step back and check the design It's always advisable to check how the overall look is panning out throughout the process. Reveal all of the middle hulls to see how everything looks together. If it looks too straight and formal then the surface is continuing without a break. To add interest, take one of the upper decks, copy it and turn it into a duplicate version. Push it out a bit further to make an extended structure. These new platforms are good areas to place cannons, as they can get a better shooting angle.


06

07 Add functional mechanisms After checking all of the connected parts, go back to complete the mechanical joints, including the mechanisms for both side sail wings and for the main sail wings. These need to be connected with the mechanical parts and should lead to the central system. In this case, the central area will be the ship's keel. The keel area has plenty of equipment from the front to the end of the ship, so it's essentially the nerve centre of the ship. You want to add many details to make it feel functional.

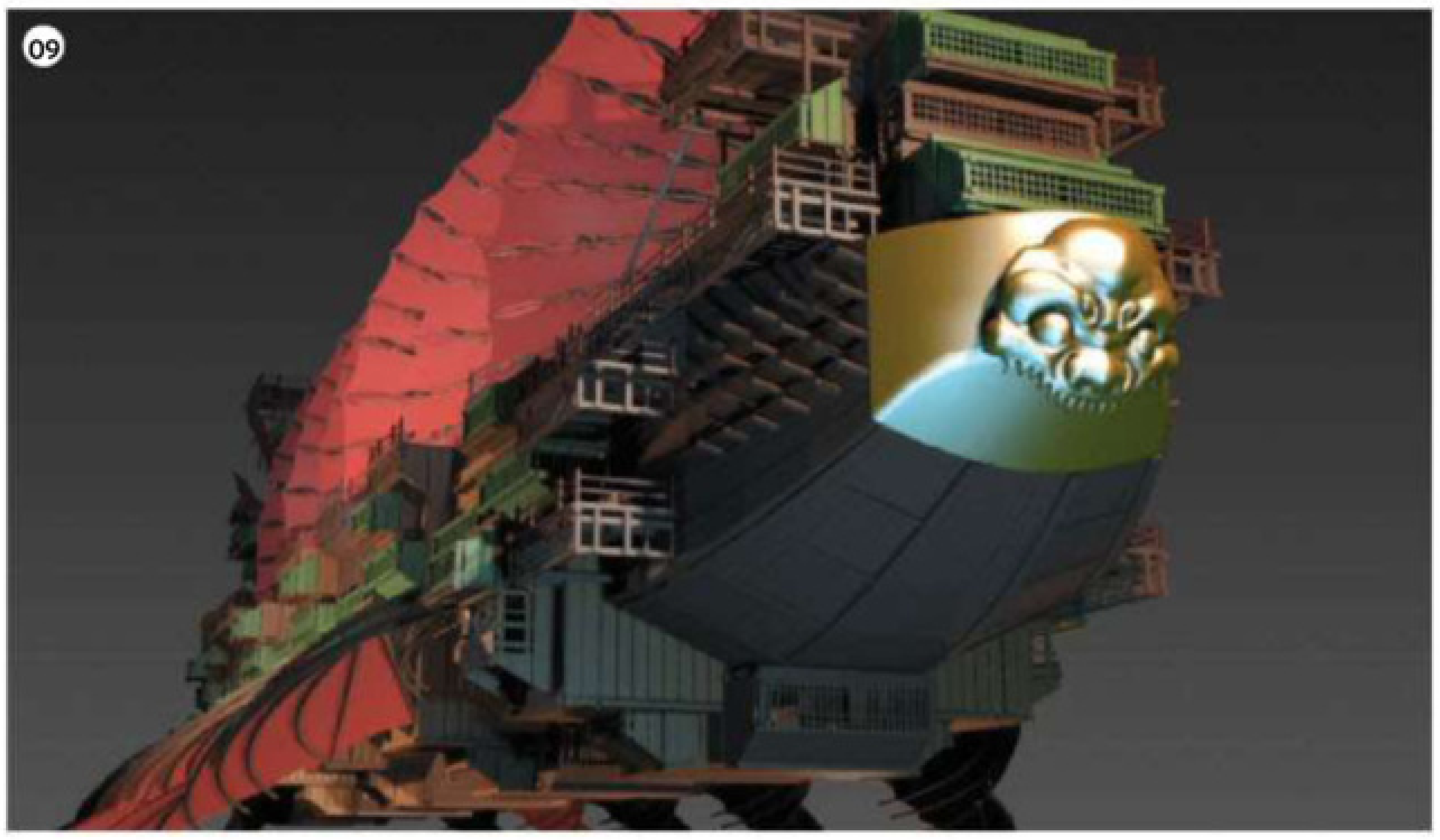
08 Finish the rear towers For rear towers I won't be creating a semi-open structure, so there is no need to work on the interior parts of the ship for these elements. Instead, I focused mainly on the exterior details of the towers. I used images of Chinese temples as my reference for the shape of the towers. To make them feel larger and more imposing, I created an extended structure with parts that hang out. This way, the tower seems to get bigger as it gets taller, and it gave me more space to add some beautiful Chinese roof details. Remember that this is fantasy; while we want things to feel believable, they don't always have to be physically accurate.





Focus detail in specific areas

We can't put details everywhere on the ship, as it'll get too noisy and it'll take too much time. Instead, we need to pick a few key areas. To do that, create highlight details for the chosen areas, and in others dial the detail back – you want the eye to naturally fall on your focal points. On my ship, I spent time adding details to the stern tower, the bow, the propellers and master cannons. These elements really emphasise the ship's fantasy style.



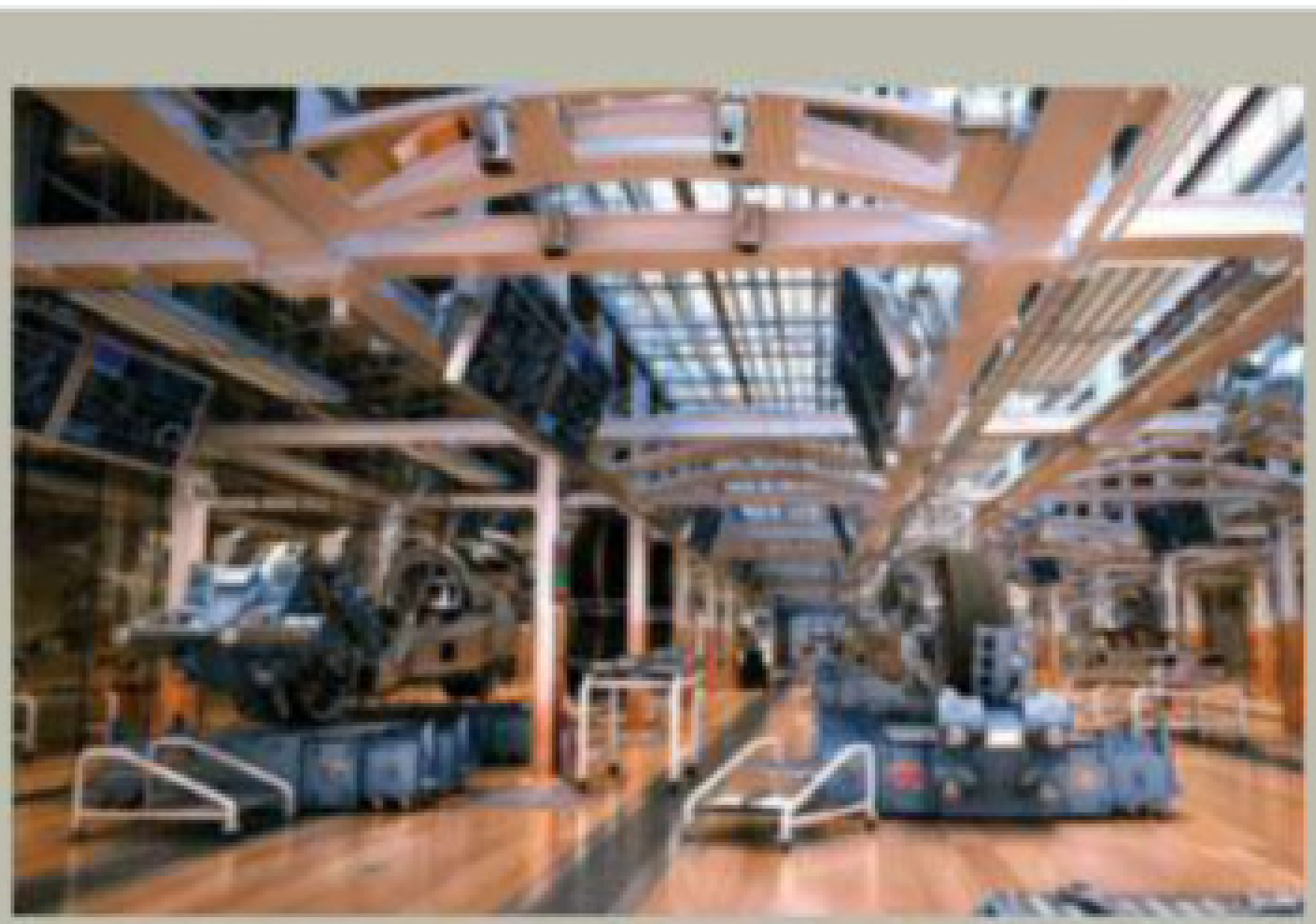
09 Complete the bow Generally, this is the most armoured part of the whole ship as it needs to be built for combat collision. For dynamics, if you want the shape to be stronger, you need to keep it as simple as possible. As such I didn't got crazy with the design here, then added some metal decoration onto its surface. Something fierce-looking works best!

Artist Showcase

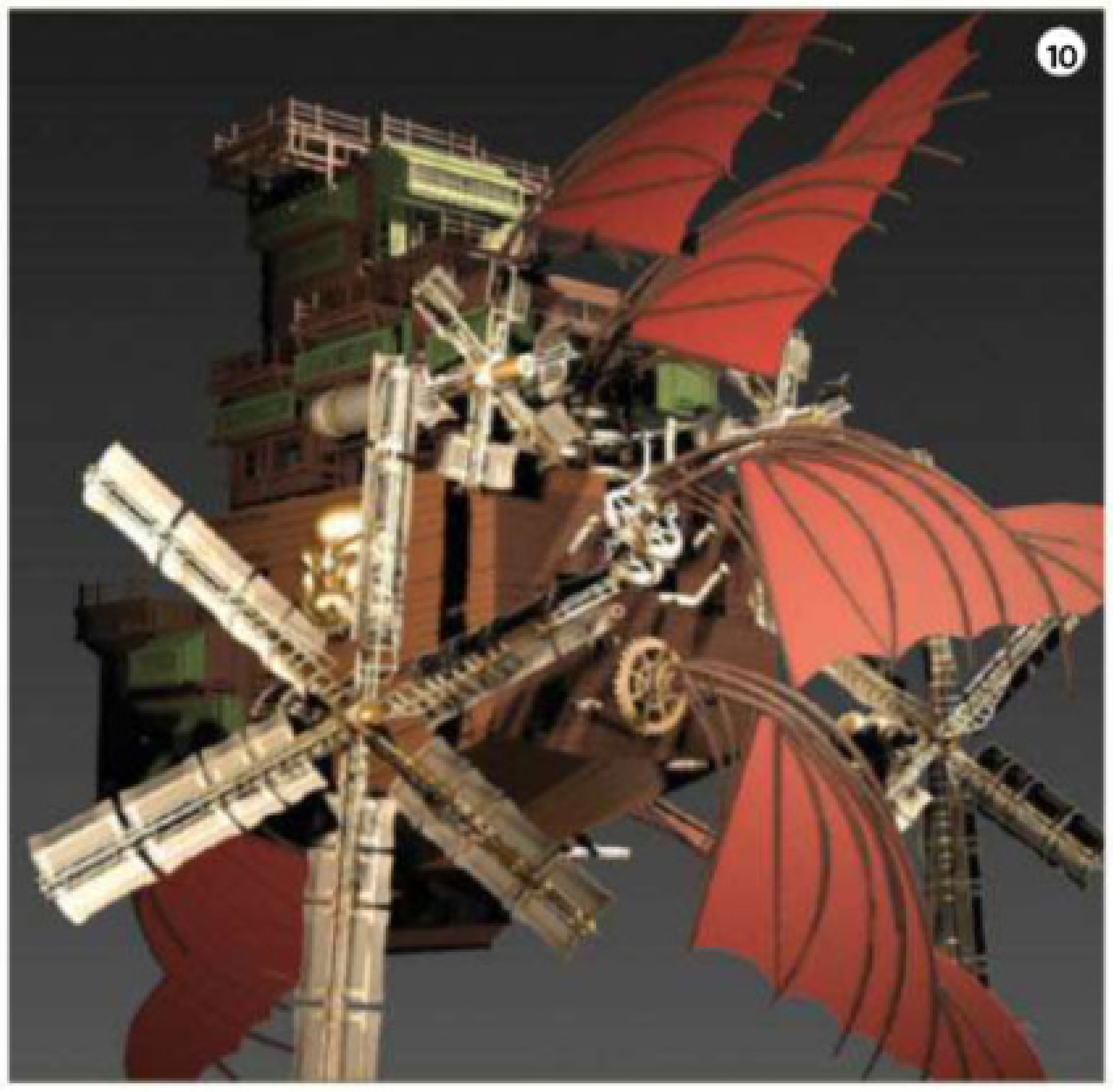
Stefano Tsai

My name is Stefano Tsai and I am a concept designer and 3D artist. I have been working in the game and entertainment business since 2001, and even though I have spent over a decade in the industry I still feel incredibly excited when thinking about my future projects. I am currently working as a freelancer on various film and videogame projects.

Factory production line of scout robots 3ds Max (2013)
An automatic machine for producing military robots. You can see how friendly the employees are.



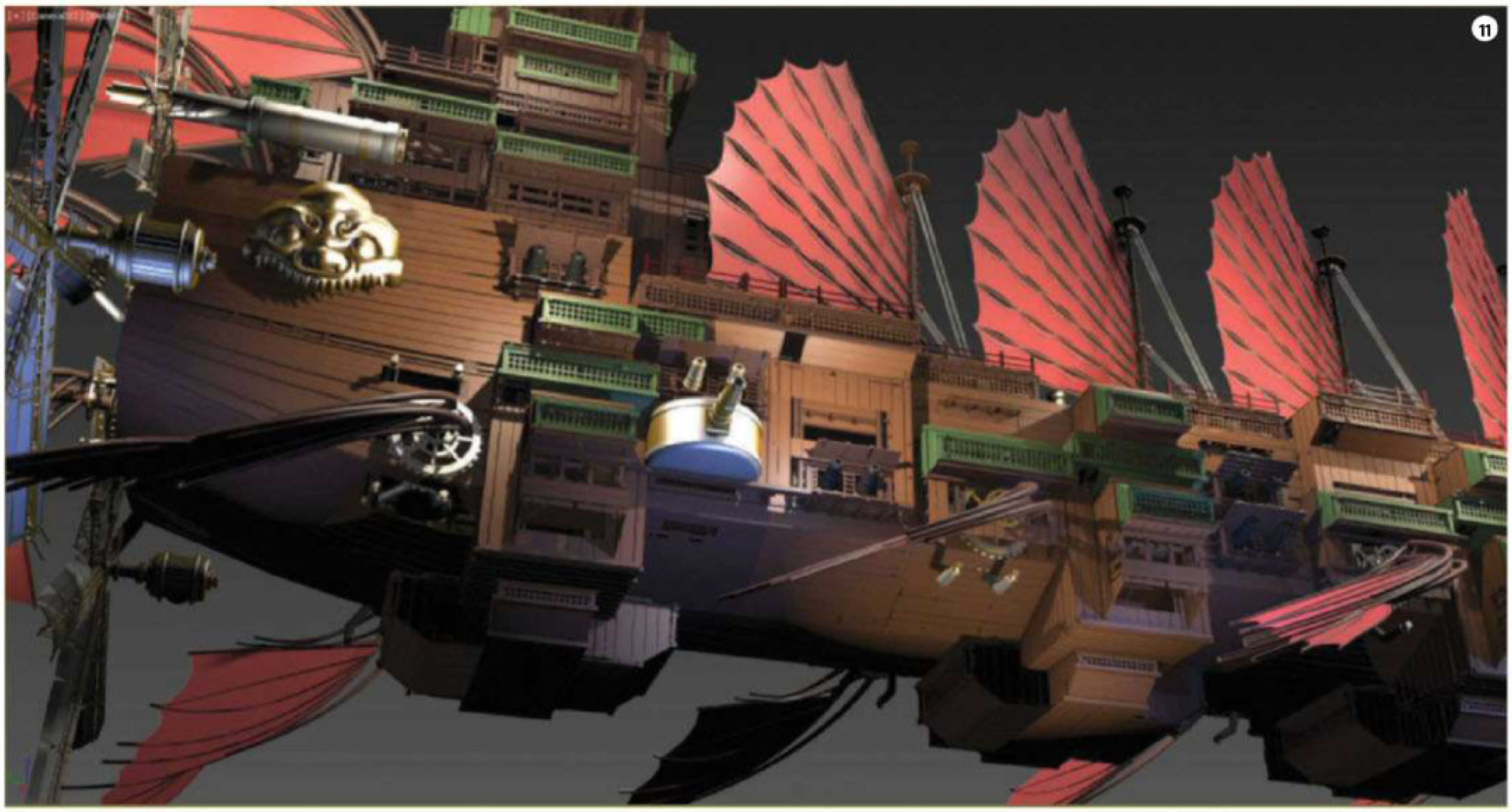
Factory production line of enforcement vehicles 3ds Max (2013)
A comfortable and cosy production line in a factory, building law-enforcement vehicles.

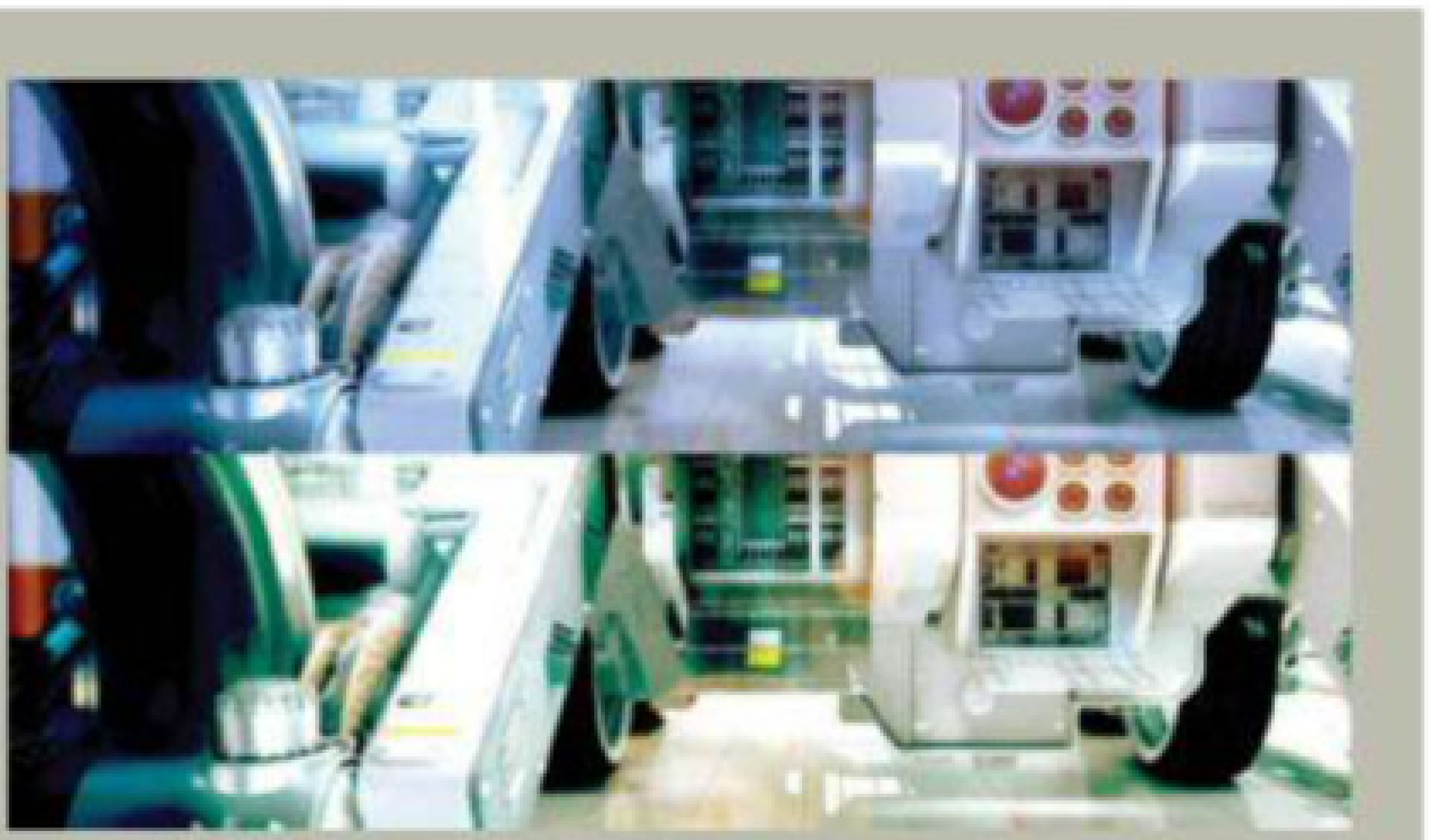


10 **Give it power** The wings and the propellers are the source of power for the ship. Obviously we can't get reference for these from real ships, so we need to look elsewhere. The surface of each of the propellor blades needs to be huge to push the ship forward and to maintain a reasonable rotation speed – you don't want it to spin like a mower! For our fantasy vehicle, it makes more sense for it to move more subtly. Aesthetically, its size can make it a key element of the ship. Don't be shy about making it much bigger than you think it needs to be!

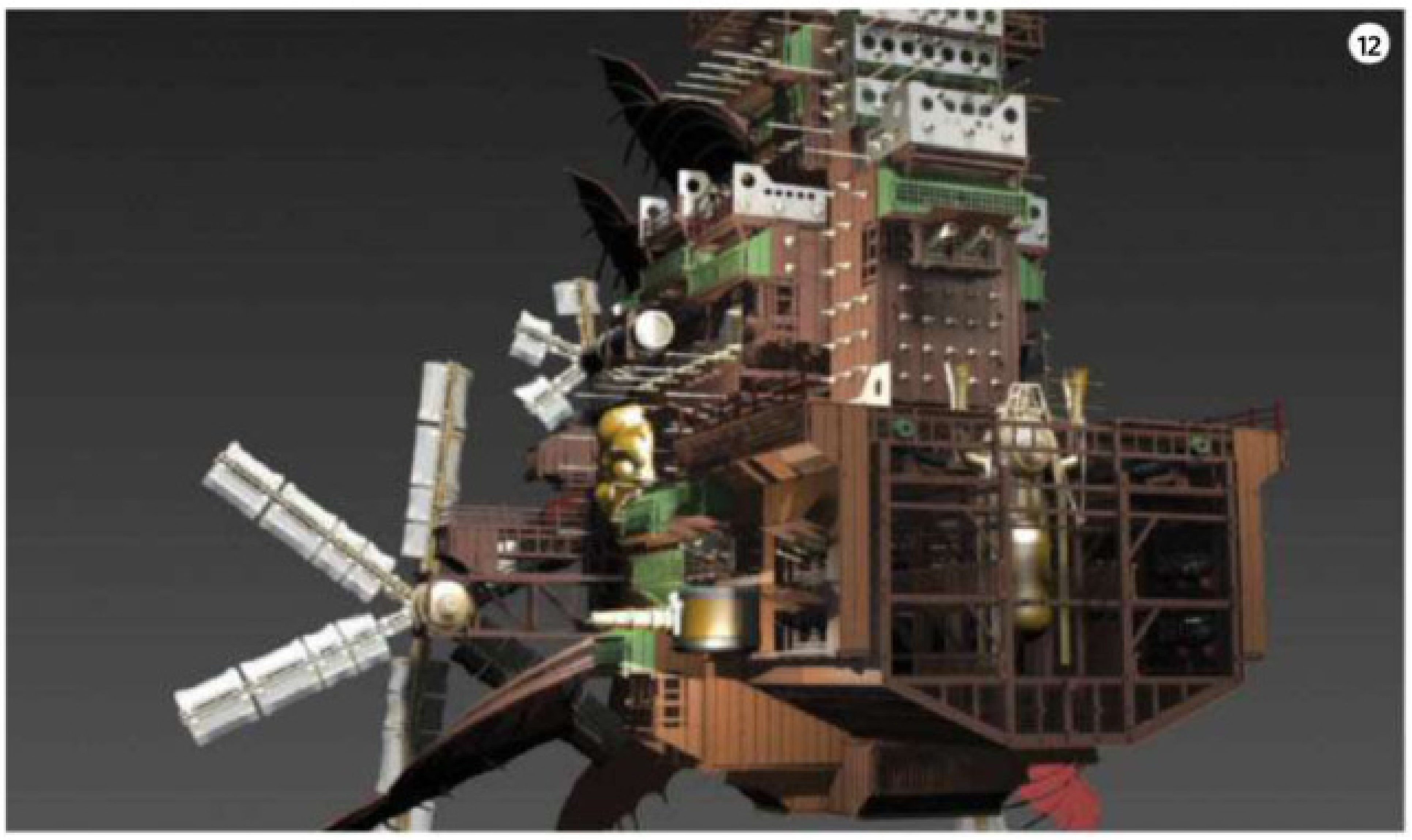
11 **Include weapons** There are three cannons on this ship – one is on the top deck, another one is mounted on the wall, and the biggest one is near the bottom of the ship. Let's focus on the biggest one, as it is the main weapon and it's much larger than the others. It can be seen much more clearly and it should be the most advanced equipment on the ship. Put the effort into these big cannons, as they can be seen much more clearly than other two.

12 **Work on the rear** The rear of the ship is the biggest target for the enemy, as this is where the officers and the commander rest. Naturally it makes sense to have lots of heavy armour to surround it and to protect the high-ranking officers. I added some decals and decoration on top of this armour to enhance the fantasy feel. I also added some communication equipment and large, armoured windows to show that this is the control tower. Make the tower appear stronger, tougher and well-built so it feels ready for heavy duty work.





Car study 3ds Max (2013)
This was a study project for the front panel of a car. For the image, I tried out two different colour casts, which gave the image a different kind of tone.

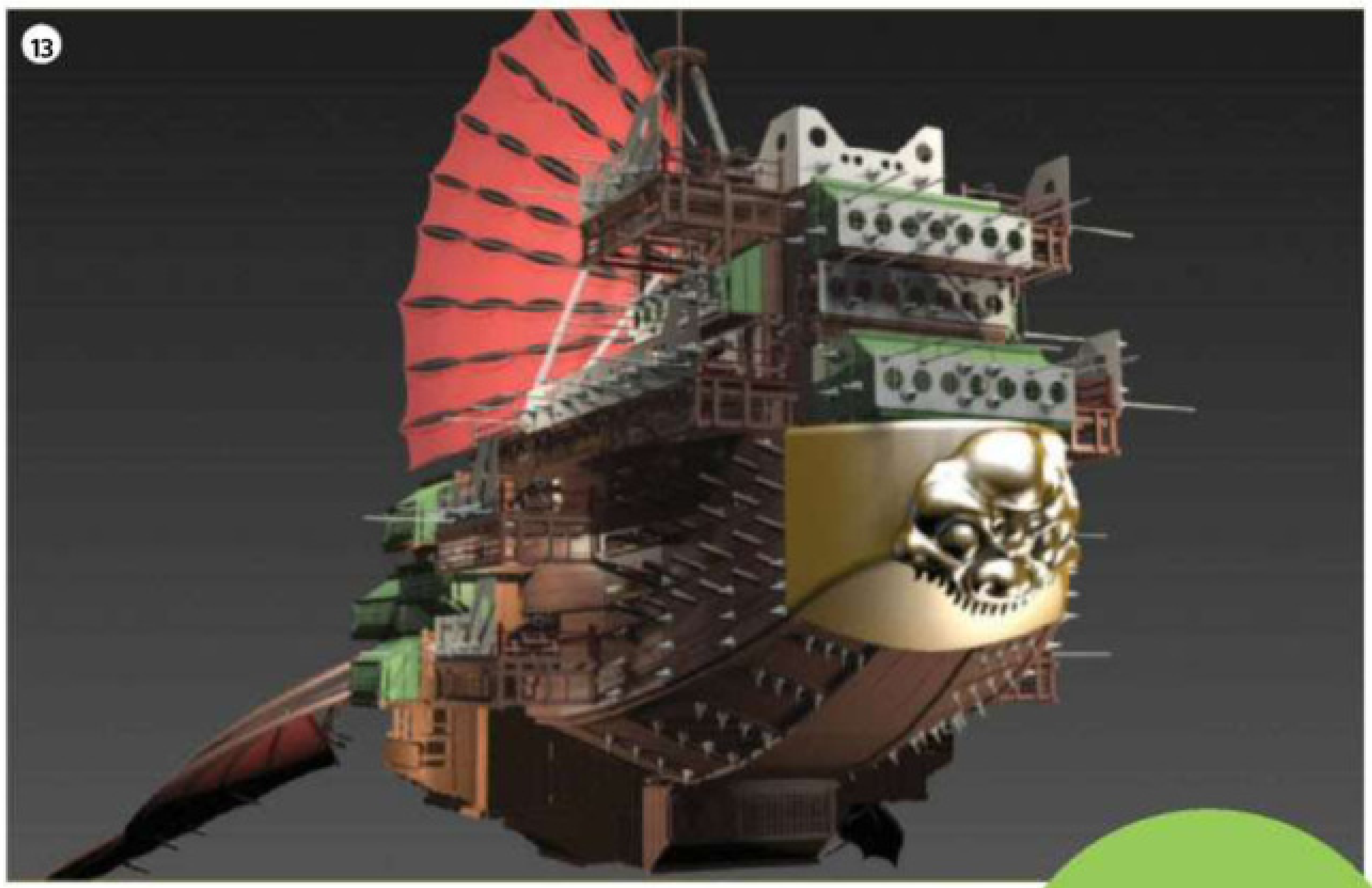


13 Focus on the front bow

Approach the front part of the ship as you did the back: it also needs to be ready for strong impacts. I installed a few scattered structures for pre-crash purposes, so that when it happens it'll reduce the damage to the main hull. The same goes with armour – keep spreading the same style of armour protection boards around the ship. You want your ship to feel menacing and ready to take on whatever is thrown at it!

Try out different looks

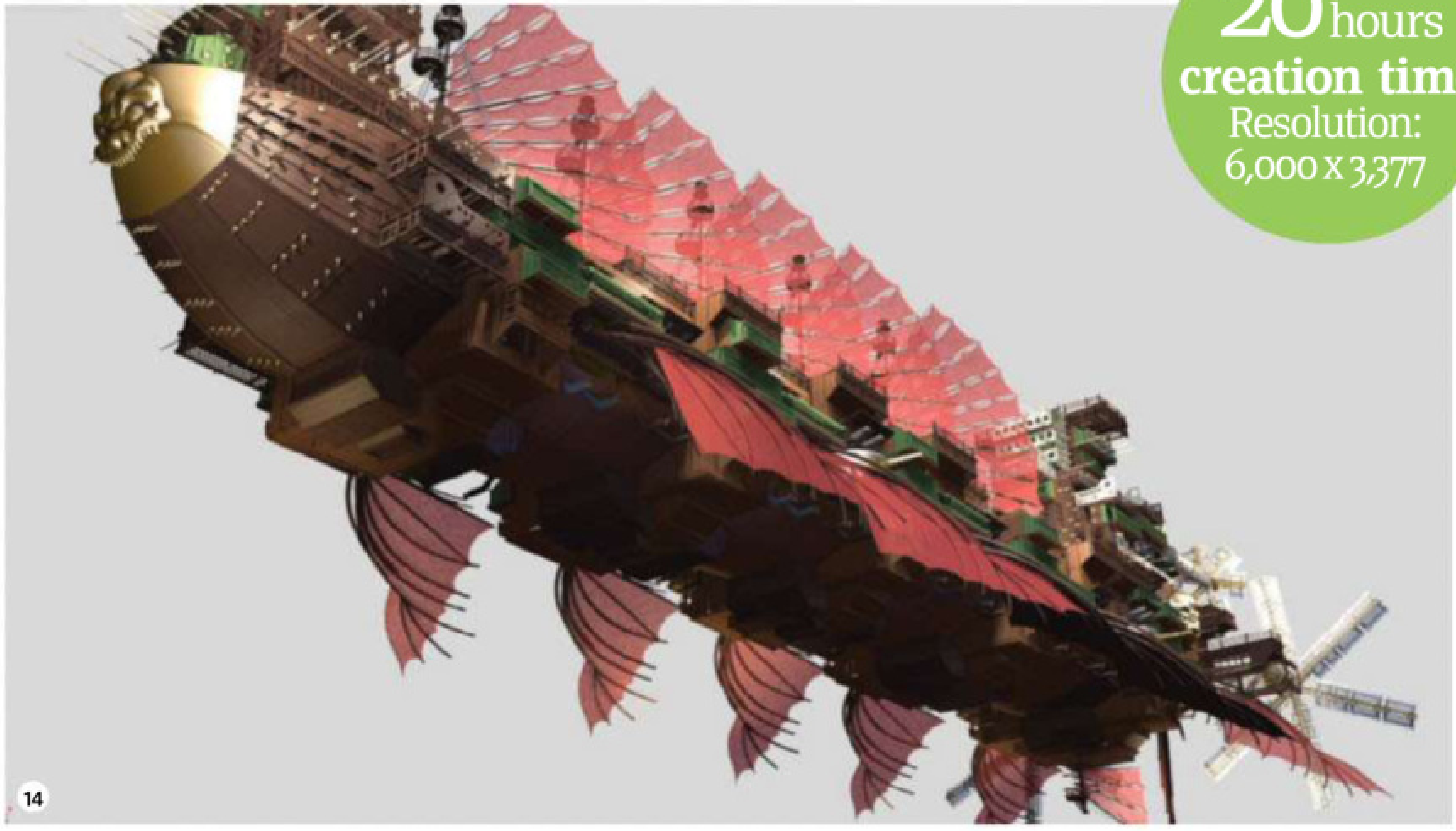
Once you've built up the basic shape of the ship, don't be afraid to try out other compositions. This is just the start of the process and the idea is to explore your idea and to refine it. In my project, I quickly grabbed the upper decks and duplicated them to create decks below the ship's main hull. It's not very precise, but it gives an idea of how it will look straight away. If you like the new idea, it's so easy to go back and modify the model to include it.

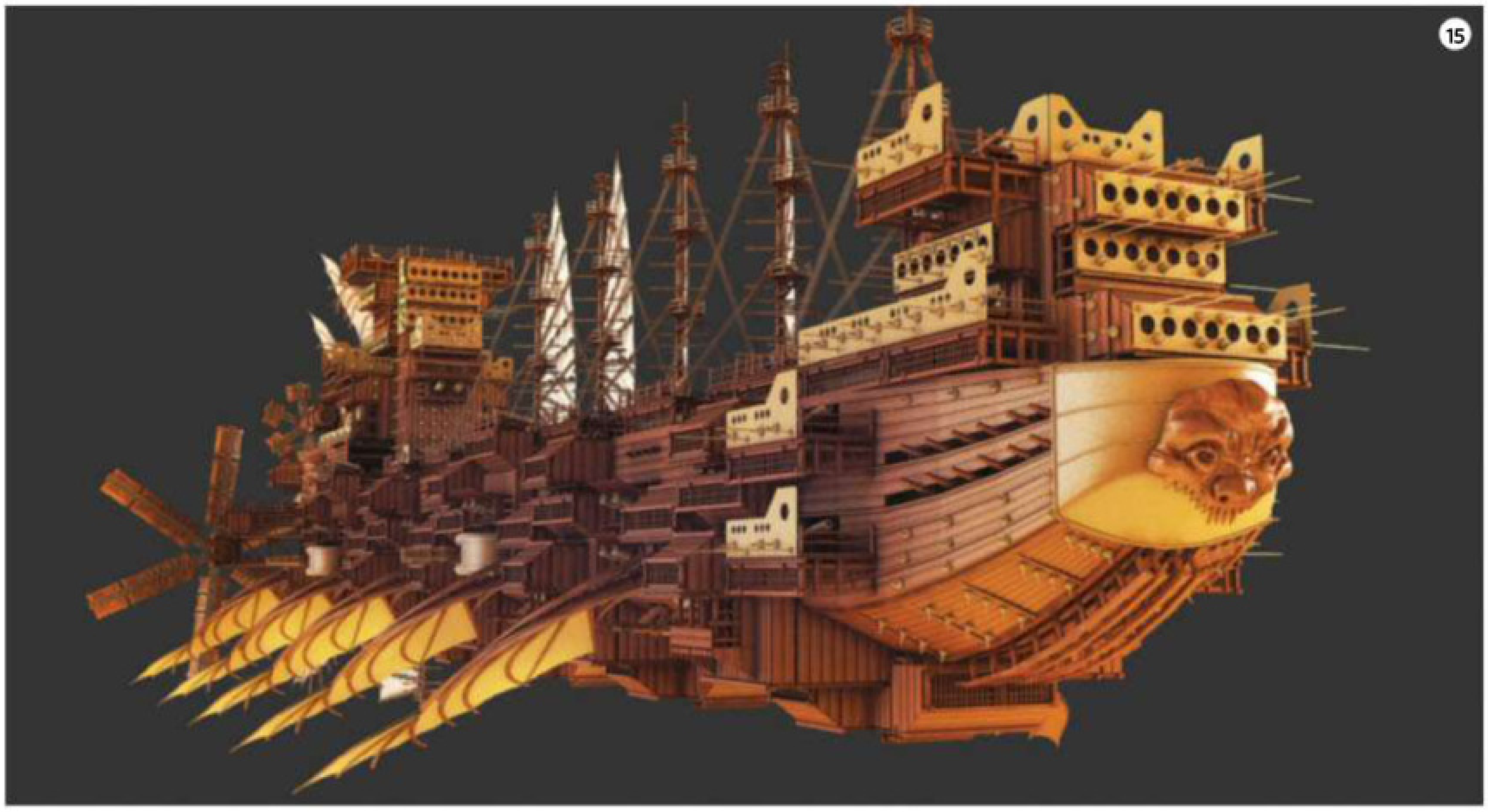


20 hours creation time
Resolution: 6,000 x 3,377

14 Check for overall balance

Check the model to see if everything is balanced. At this stage, I realised that the main mast near the rear tower was too close and covered up almost 70 per cent of visibility, so I deleted it, and then added more details on the other masts to make them appear stronger and to make them easier for the crew to climb up. For the crew's safety, I also built a few small platforms along each mast. I also added a small rudder-esque wing at the ship's end to give it more control. Look around to see if everything is well balanced and if not, start playing with new ideas.





15 Materials, lighting and render

This image only focuses on the modelling process in relation to the concept and we didn't spend any time on proper unwrapping, textures or lighting. You can see a quick result on the left, where we have only applied box mapping and a few materials such as wood, metal and fabrics. I used V-Ray 3.0 and an image-based method to create a quick previs image. I also applied an AO layer in Photoshop. To finish up the image, give the materials a slightly rough texture and make the colours and lights a little more lively.

• **DID YOU KNOW?** • All tutorial files can also be downloaded from: www.3dartistonline.com/files

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ADDING DETAIL The MultiScatter plug-in was handy when it came to scattering objects like the plants and grass along the slopes. I also used the Ivy Generator, which I used not just for creating the vines on the walls, but also for distributing custom meshes along the vines. I did my post-production in Photoshop and used selective overlays of dirt textures. **The Firefly Cottage,** 2014

Ifthikhar AN

3DArtistonline **Username:** Ifthi

Website www.ifthikhar.com

Country India

Software used 3ds Max, V-Ray, Photoshop

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3DArtist Masterclass

Gustavo Åhlén is the founder and creative director of Svelthe. He is also a professional 3D/VFX designer and matte painter for films, games and advertising

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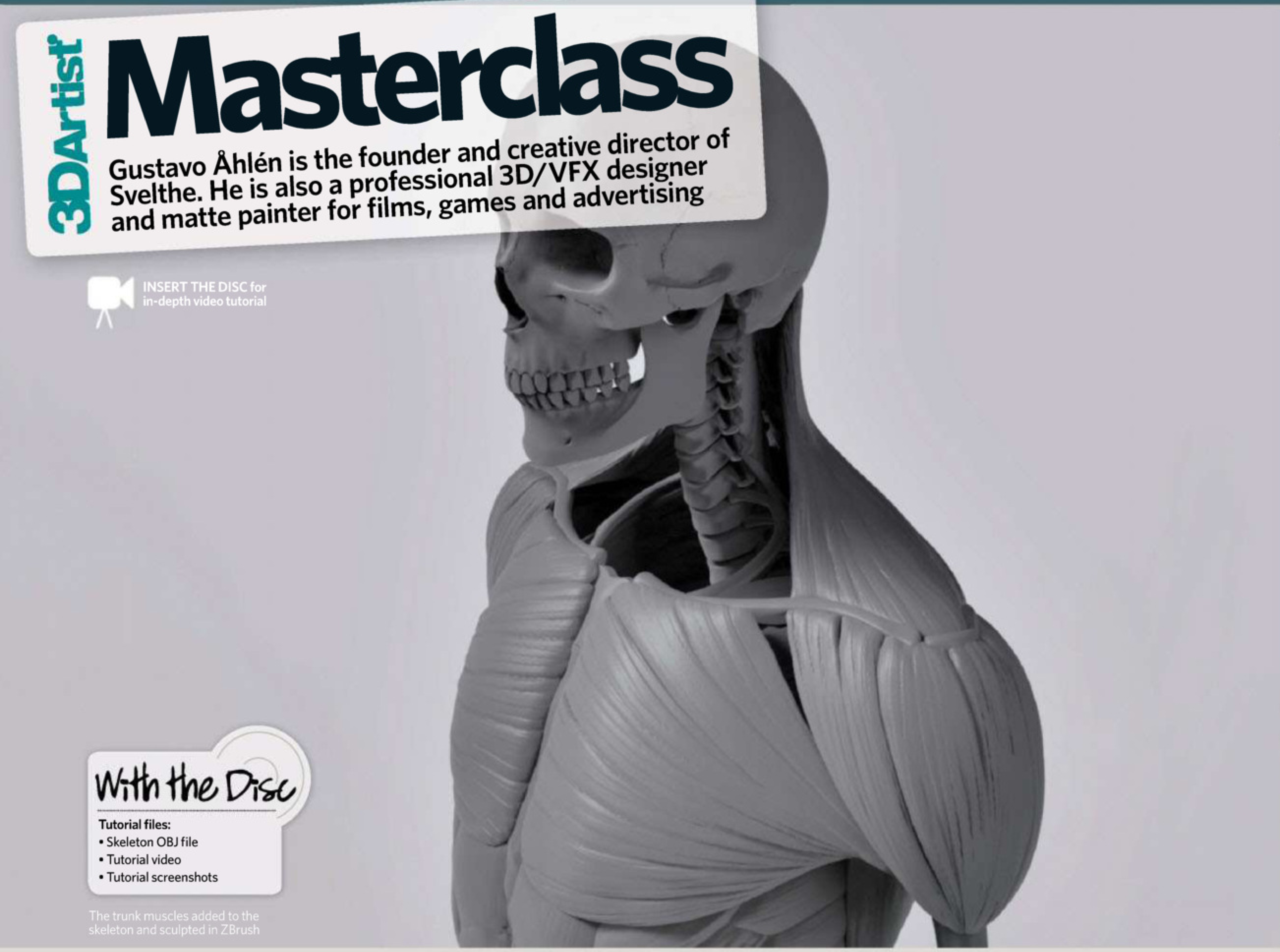


The trunk muscles added to the skeleton and sculpted in ZBrush

Sculpt the torso muscles in ZBrush

Build up the trunk muscles of a torso

In this tutorial you will develop an understanding of the trunk muscles and how they are connected with the bones. This will help when it comes to sculpting the muscles. Like the previous part of this series, it's important to work from reference images to maintain realism in your work.

In this part of the series, we're going to focus on the core muscles before delving into individual muscles. Basically, the trunk region is from the shoulders down to the iliac crest. The shape of the trunk is linked with the rib cage, and the rib cage is separated from the pelvic region by the muscular body wall. The trunk is made up of the abdomen and the thorax and it can be divided into three major regions, which are the back muscles, the chest muscles, and the abdominal muscles.

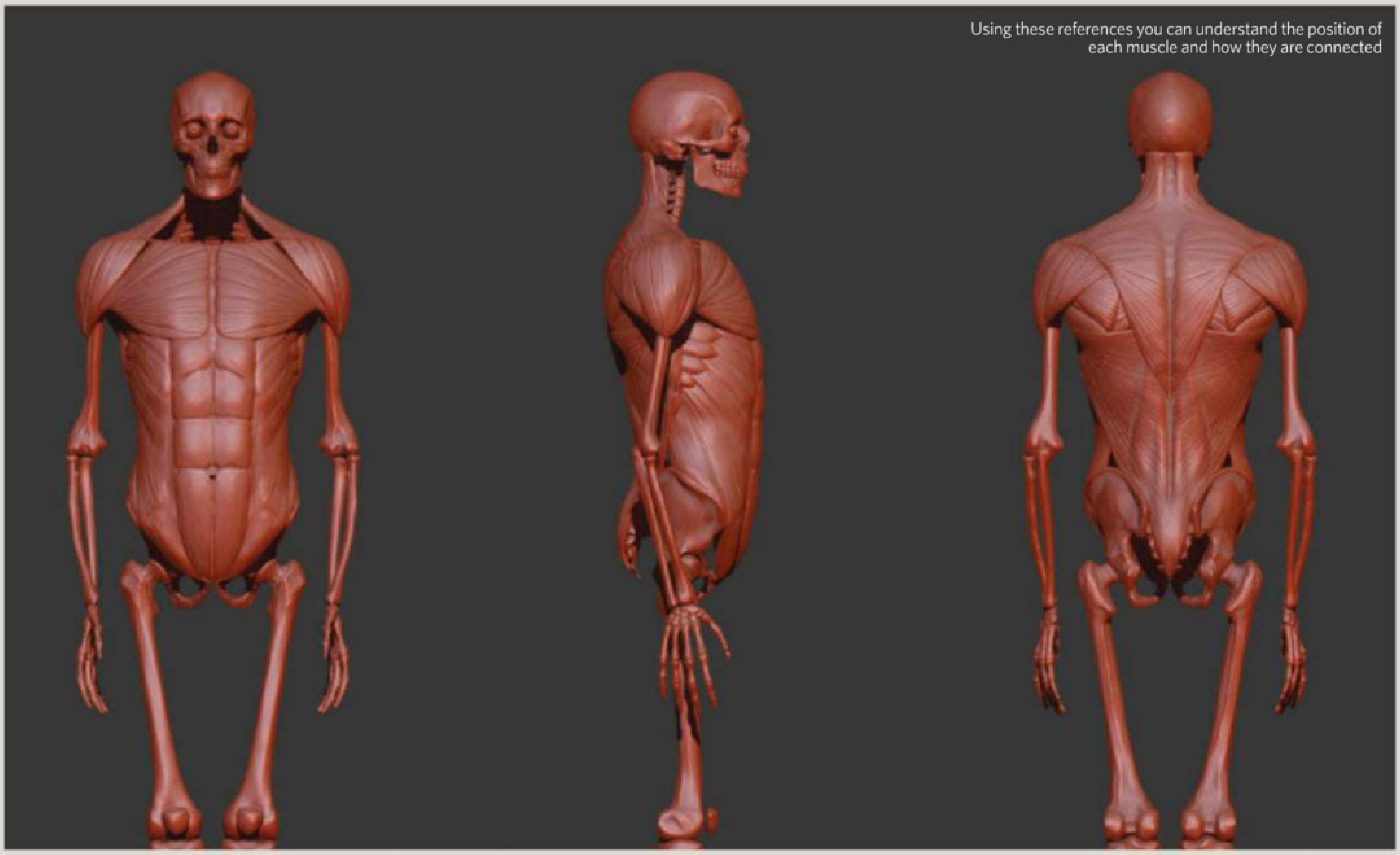
Generally speaking, the back muscles are separated into two groups: the extrinsic muscles that are associated with the upper body and shoulder movement, and the intrinsic muscles that are related to the movements of the vertebral column.

We'll take a quick look at the extrinsic muscles and how they are connected to the upper body and the trunk. The muscles form a V-shape, with the upper back and the middle, including the trapezius, levator scapulae, the rhomboids and latissimus dorsi. In the middle of these muscles there's the serratus superior, posterior and inferior.

The intrinsic muscles stretch from the pelvis to the cranium and they help to maintain the movement of the vertebral column and our posture. We can divide these muscles in three groups as the superficial layer, the intermediate layer and the deep layer.

The chest muscles occupy the thoracic region of the body below the neck and above the abdominal region, including the muscles of the shoulders. These muscles enable the head and arms to move.

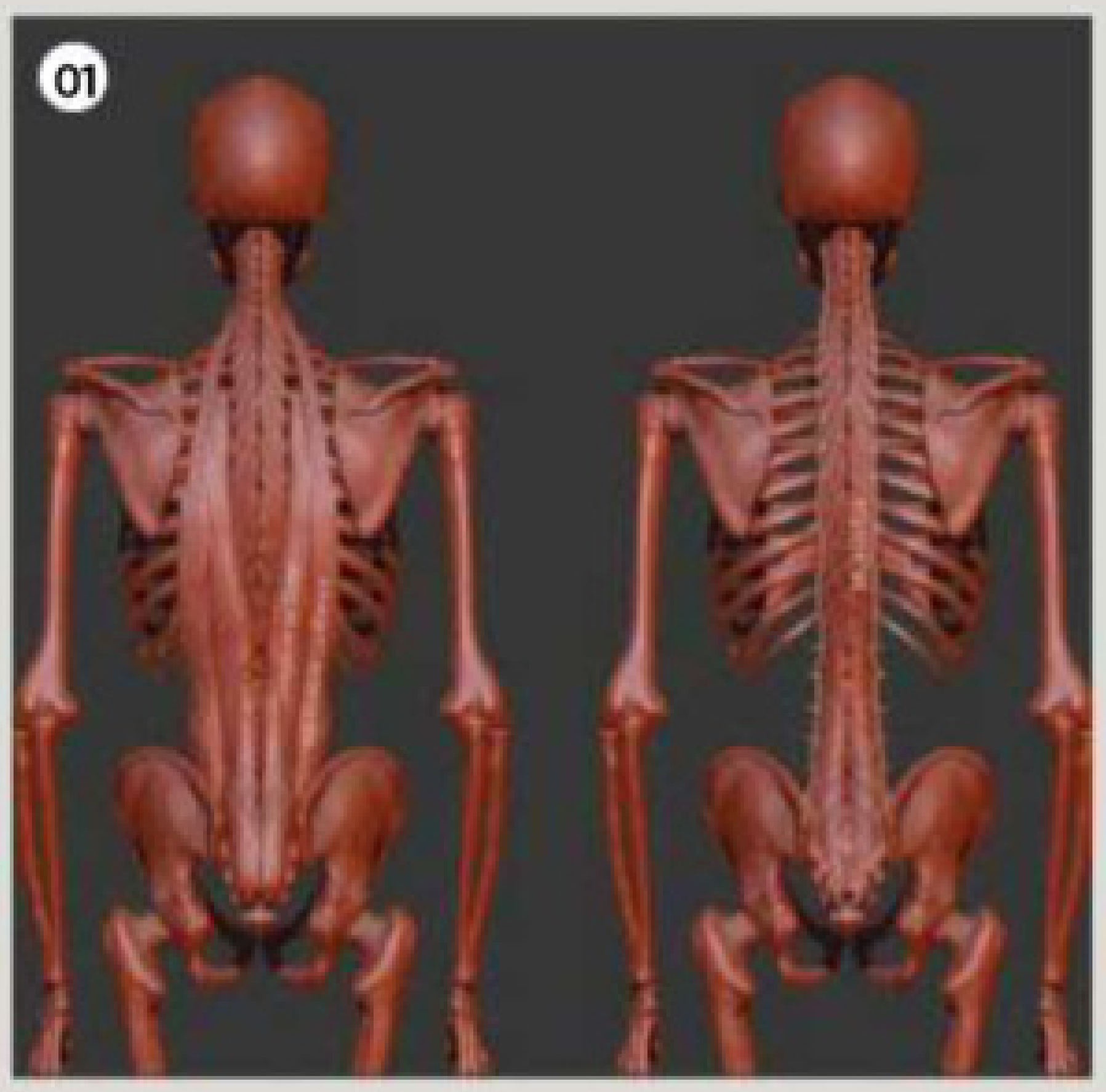
The abdominal region is separated from the chest by the muscular wall. These muscles are across the front surface of the body from the lower rib cage to the upper part of the pelvis, as well as the transverse and rectus abdominis and the internal and external oblique muscles. This is the region that protects the delicate vital organs within the abdominal cavity, but they also help to maintain stability and posture.

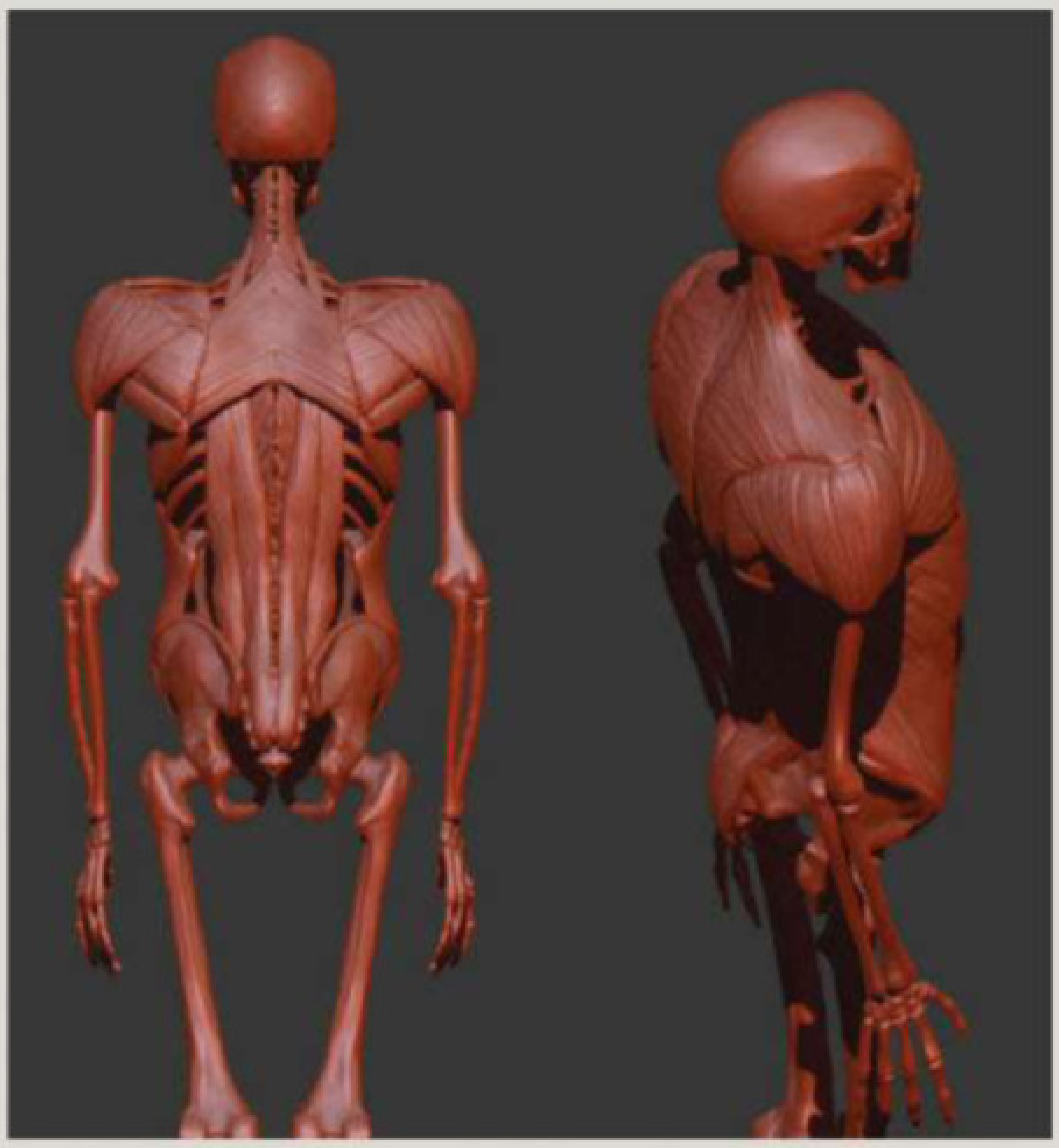


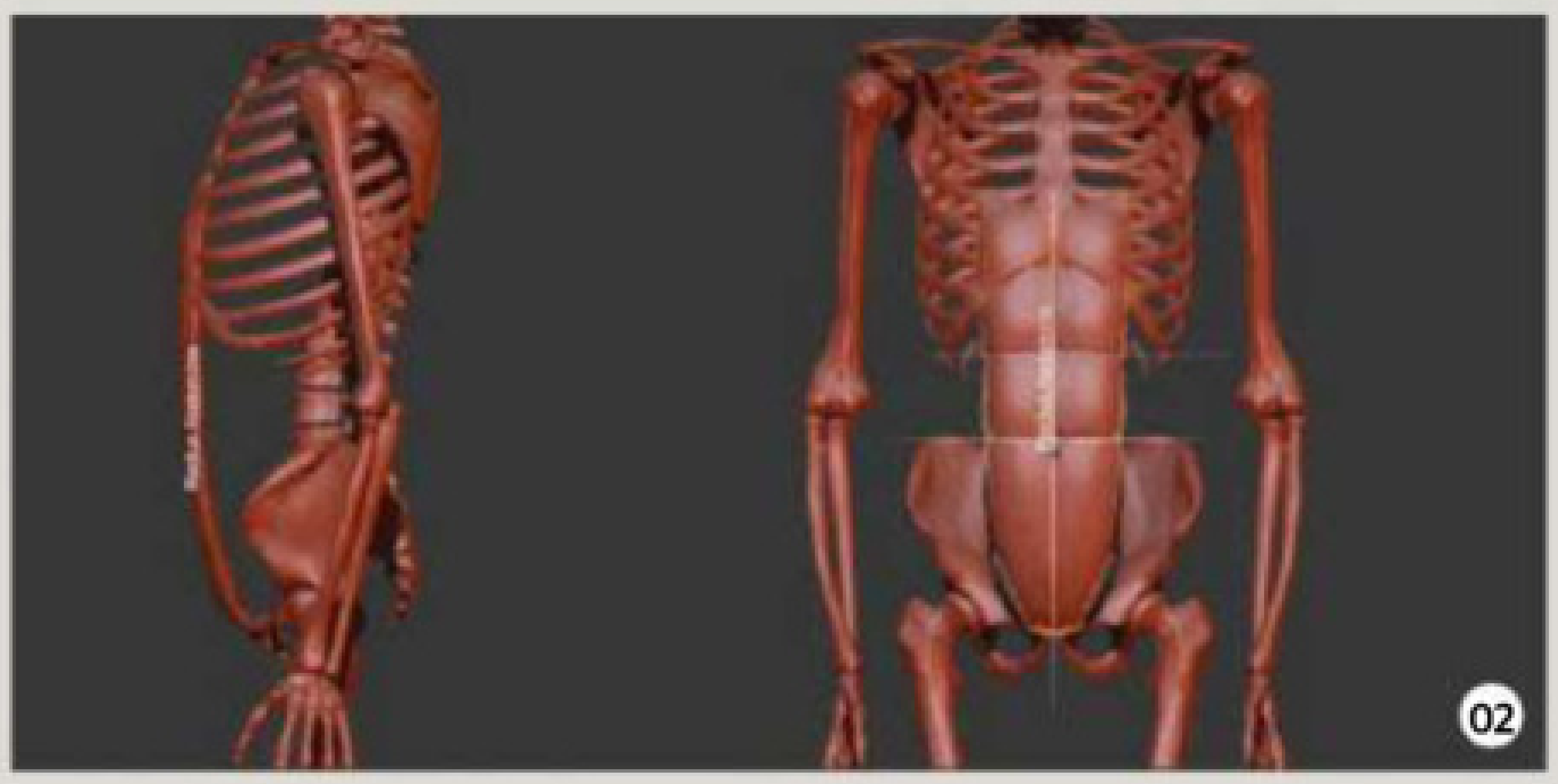
Using these references you can understand the position of each muscle and how they are connected

Use ShadowBox to help build up initial shapes and forms

Go to Lightbox>Tool and add Shadowbox128, which will create a new tool. Go to the tool of the skeleton and using Insert, select Shadowbox128. Now, resize the ShadowBox, trying to cover up the muscular region. Then, while you hold Cmd/Ctrl you can draw the muscle shape using the front and sided views of ShadowBox. When you mask some areas of the ShadowBox, this will develop the mesh according the painted co-ordinates. Therefore, to create thin muscles you can use an InsertCylinder brush over a SubTool, and this will create a new object in a separated PolyGroup.







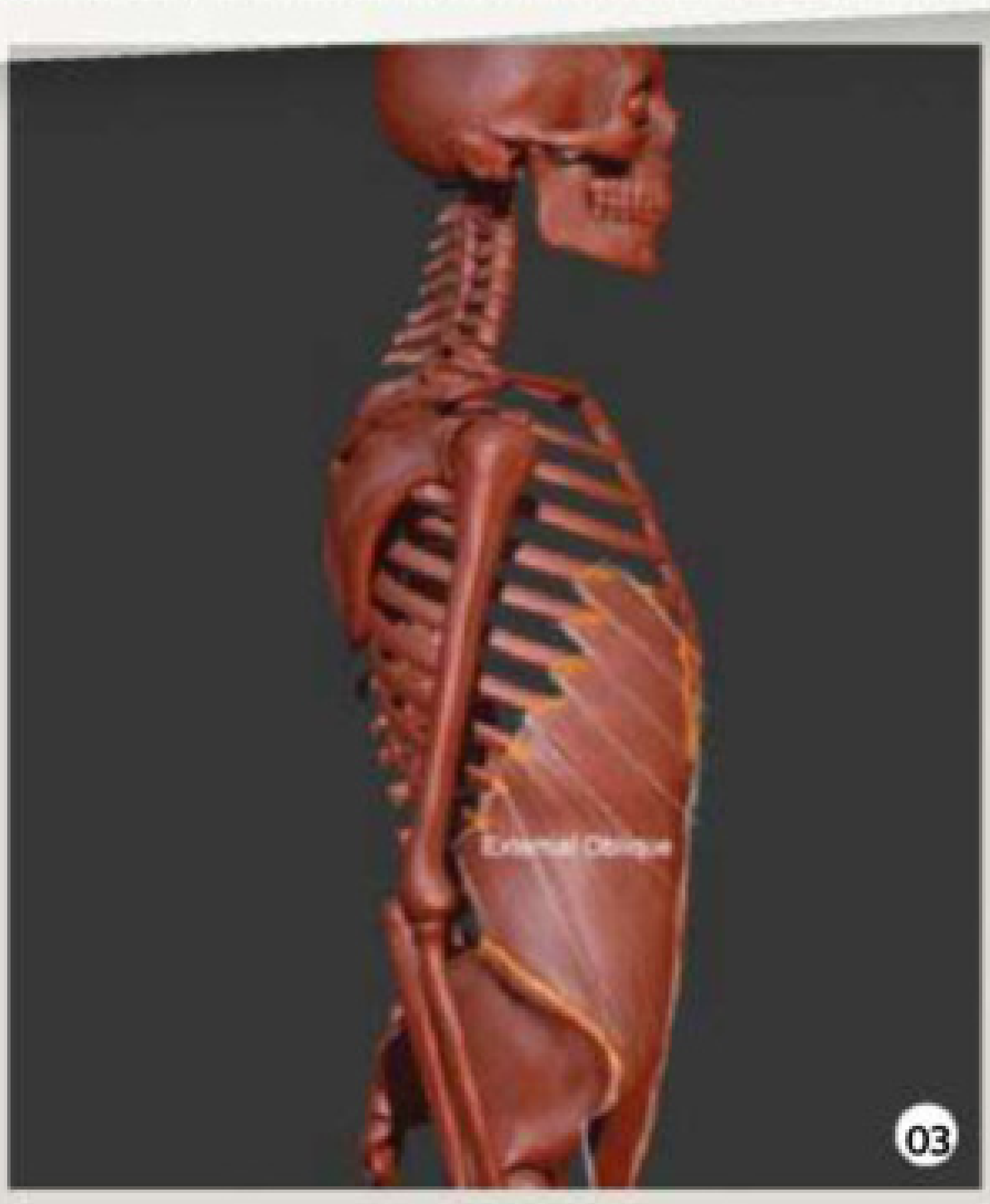
Description of the origin and insertion of the trunk muscles

01 Erector spinae muscles

This muscle is a group of muscles, including the iliocostalis, spinalis and longissimus muscles. The origin is from the sacrum to the base of the skull. Take a look at the method in the ShadowBox information box to the left see what technique will be used to create this series of muscles. Go to Lightbox>Tool and add Shadowbox128. This will create a new tool. Go to the Skeleton tool and with the Insert function, select Shadowbox128. Resize the Shadowbox and use a mask (hold Cmd/Ctrl) to draw the shape of the muscle over the Shadowbox, according to the front and side view. Now uncheck the Shadowbox.

02 Rectus abdominis muscle

The origin is located at the pubic crest of the pubic bone with an insertion in the outer surface of the costal cartilages of the seventh, sixth and fifth ribs together to the anterior surface of the xiphoid process. Add this muscle using the Shadowbox, and once you get a separated SubTool, use the Move brush to edit the muscle to the insertion and origin. Then, using ClayTubes or Inflate brushes, you can give more volume to the muscle. You can use TrimDynamic to flatten the rounded areas.



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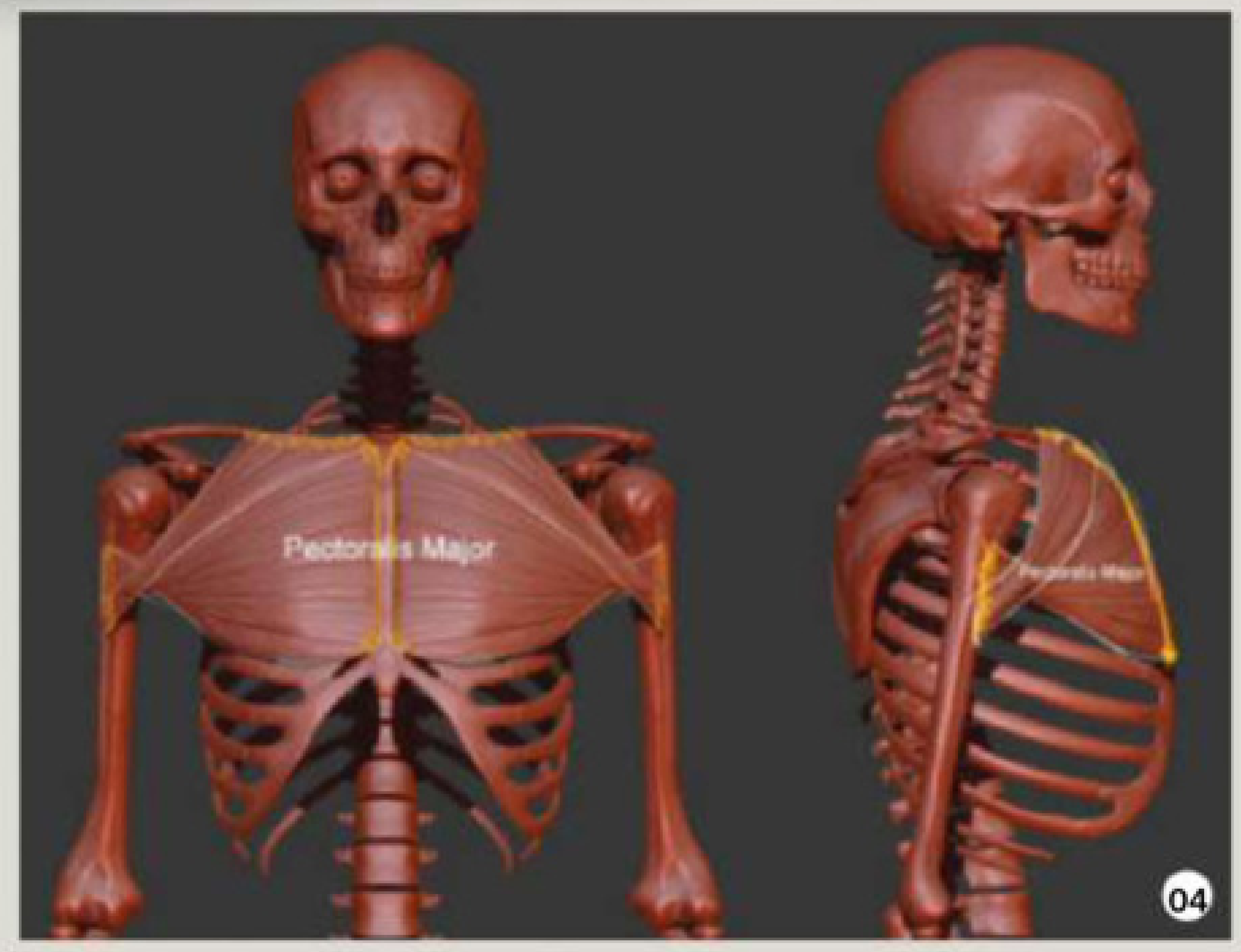

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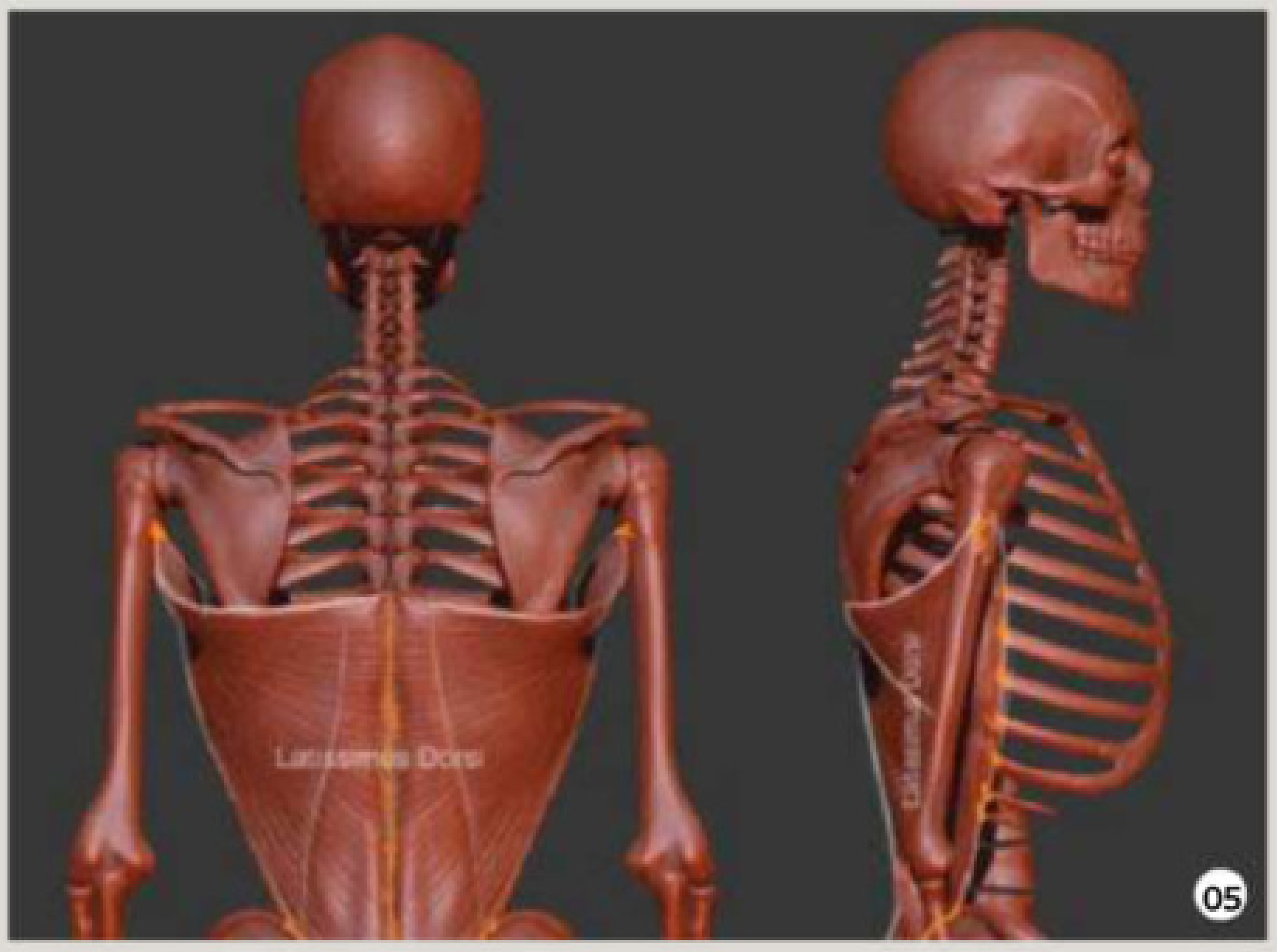

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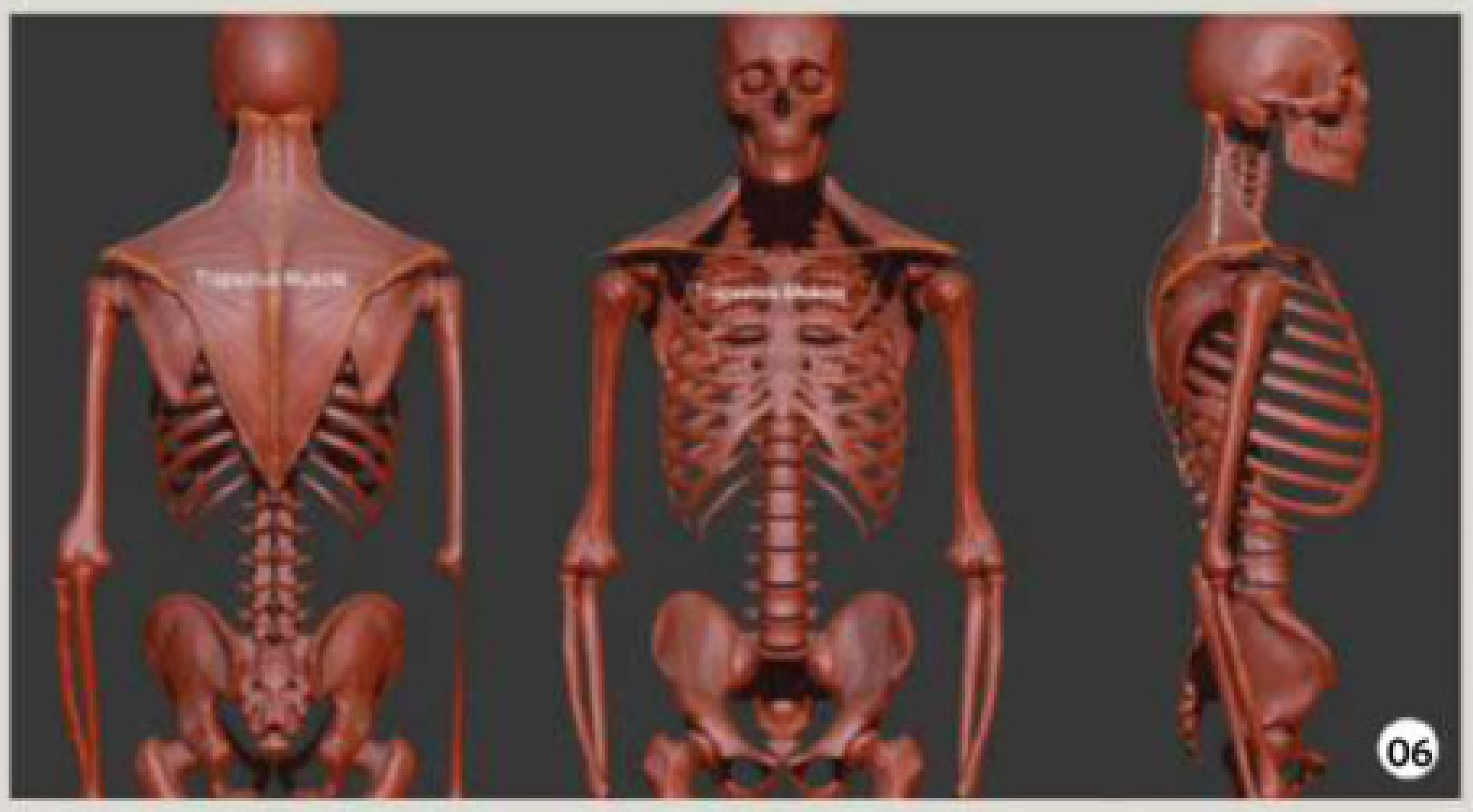


06

03 External oblique muscle

This muscle is located at the lateral and anterior parts of the abdomen. The origin is located in ribs 5-12 and the insertion in the iliac crest, pubic tubercle and linea alba. Between the external oblique muscle and the rectus abdominis you will find the semilunar line, a tendinous furrow. Using Shadowbox we can create this muscle and edit the shape using the Move brush. You need to find the right landmarks to adapt this muscle to the correct position

04 Pectoralis major muscle

The origin is located at the anterior surface of the medial half of the clavicle and in the anterior surface of the sternum, the superior six costal cartilages, and the aponeurosis of the external oblique muscle. The insertion is located in the lateral lip of the bicipital groove of the humerus. The pectoralis is divided into clavicular and sternocostal parts. This muscle is commonly flat, but this will depend of the development of its muscular mass. I also used Shadowbox to create this muscle and with the help of the Move, ClayTubes and TrimDynamic brushes, you can give it a defined shape. Ensure that you keep referring to both reference images and technical guides to maintain realism.

05 Latissimus dorsi muscle

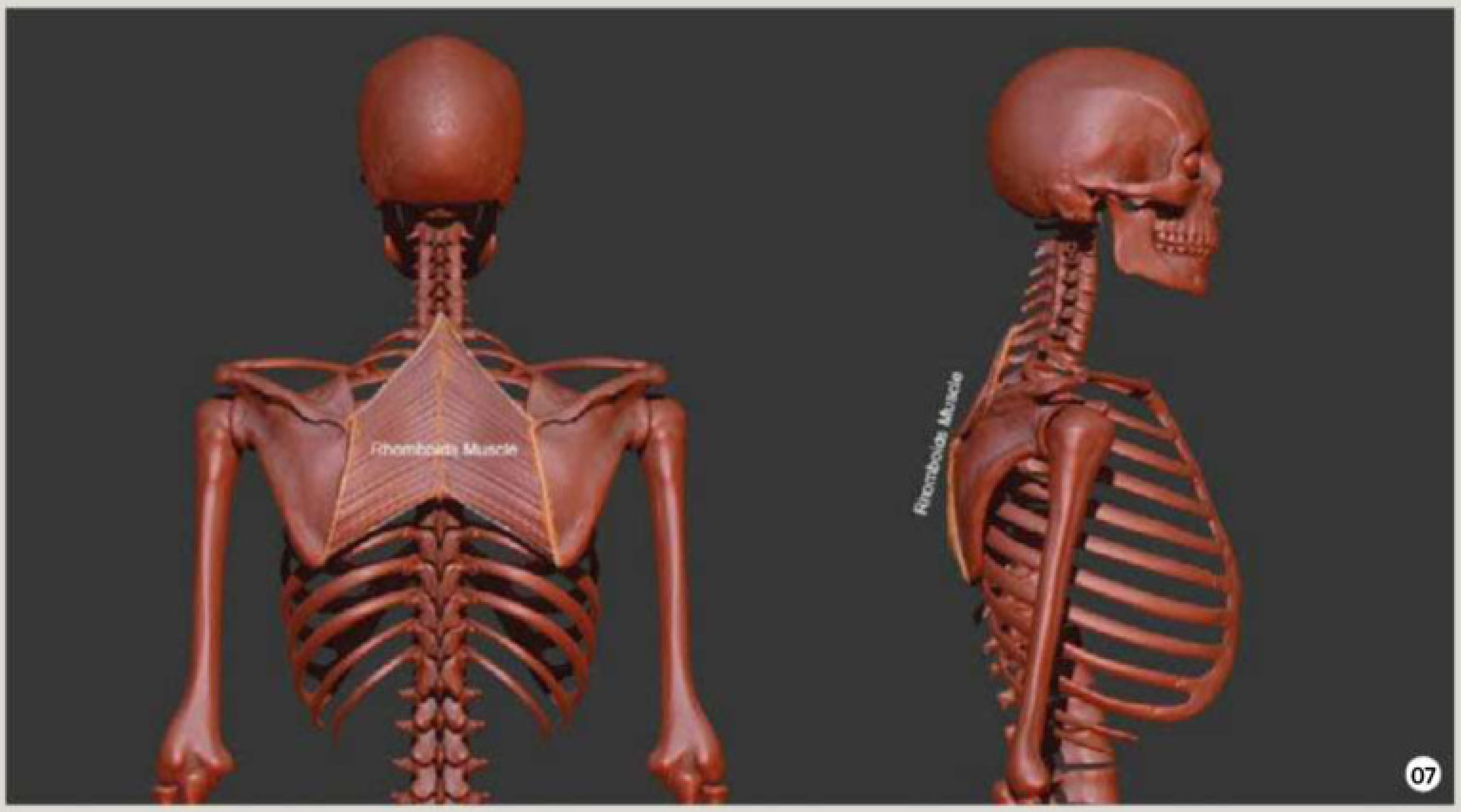
The origin is located at the spinous processes of vertebrae T5-L5, thoracolumbar fascia, iliac crest, inferior three or four ribs and the inferior angle of scapula. The insertion is in the floor of the intertubercular groove of the humerus. Use the same process with Shadowbox. You need to find the landmarks and adapt this muscle to the correct position. This muscle is external, and with the help of the Matchmaker brush set to a low intensity you can adapt this muscle to the shape of the erector spinae. Then, using the Smooth brush you can relax the mesh.

06 Trapezius muscle

The origin is located at the external occipital protuberance, nuchal ligament, medial superior nuchal line and the spinous processes of vertebrae C7-T12. The insertion is in the posterior border of the lateral third of the clavicle, acromion process and spine of scapula. The trapezius is a wide triangular muscle located on the back of the chest, the back of the neck and the top of the shoulder. Use Shadowbox and adapt this muscle with the Move brush.

07 Rhomboid muscles

The origin is located at the nuchal ligaments and the spinous processes of the C7 to T5 vertebrae. The insertion is in the medial border of the scapula. This muscle is separated into two muscles, known as the rhomboid major muscle and the rhomboid minor muscle. Use Shadowbox and adapt this muscle to the origin and insertion.



07

Use ZRemesher to remesh any stretched meshes

This process is really useful to maintain a decent quality of the meshes after all the meshes have been stretched and manipulated. When you adapt a muscle over the skeleton following the landmarks with the Move brush, you will stretch the mesh and you will lose the original quality. This is because some parts will be more stretched than others. You can activate the Draw Polyframe option to check the distribution of the polygons. A good way to fix this problem is by using ZRemesher. This will create a new mesh with a uniform distribution of polygons to improve the quality.

08 Serratus anterior muscle

The origin is located at the fleshy slips from the outer surface of the upper eight or nine ribs. The insertion is in the costal (deep) aspect of medial margin of the scapula and its vertebral border. This muscle is a large quadrilateral muscle that embraces the curved form of the rib cage and it is divided into three parts. These three parts are known as the serratus anterior superior, anterior intermediate and anterior inferior. Create just one small muscle and adapt this to the landmarks. Hold Cmd/Ctrl and if you're in the Move mode (W), you will need to hold Cmd/Ctrl+Opt/Alt and move that muscle to duplicate this one. Do this for all of the muscles.

09 Deltoid muscle

The origin is located at the anterior border and upper surface of the lateral third of the clavicle, acromion and the spine of the scapula. The insertion is in the deltoid tuberosity, halfway down the outside of the shaft of the humerus. This muscle is a thick triangular muscle that is divided into three groups of fibres. When you sculpt this muscle, it's important to keep in mind the separations. To sharpen these separations, you can use Dam Standard brush.

10 Supraspinatus and infraspinatus muscles

The supraspinatus muscle has an origin located at the supraspinous fossa of the scapula and the insertion of it is in the superior facet of greater tubercle of the humerus. The infraspinatus muscle has an origin at the infraspinous fossa of the scapula below the spine with an insertion in the middle facet of greater tubercle of the humerus. To sculpt these muscles you can use the ClayTubes brush with the help of the TrimDynamic tool. Using a Dam Standard brush, you can add more details, such as fibres.

11 Teres minor

The origin is located at the lateral border of the scapula. The insertion is in the inferior facet of greater tubercle of the humerus. This muscle can be found under the teres major and we can only see a bit of this muscle because it is covered by others. It is a small, cylindrical and elongated muscle. You can create this muscle using the InsertCylinder brush over other SubTools and with the help of the Move brush you can adapt its position as well as its shape.

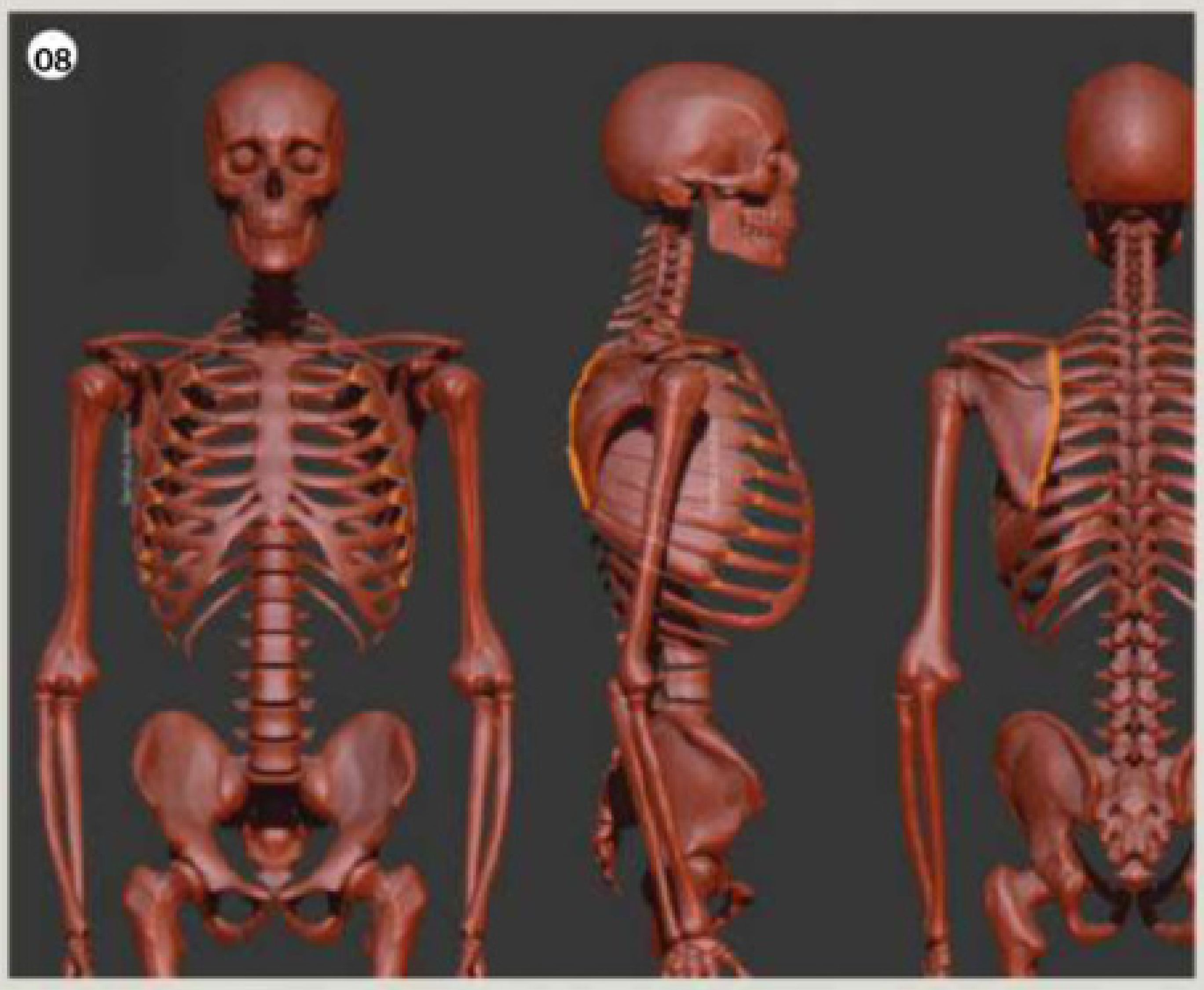
12 Teres major

The origin is located at the posterior aspect of the inferior angle of the scapula. The insertion is in the medial lip of the intertubercular sculcus on the inside front corner of the humerus. This muscle is cylindrical, thick and it seems to bulge quite a bit. You can create this muscle using the same process as the previous steps and then flattening them with the TrimDynamic brush. To create the details, try using a Dam Standard brush with Lazy Mouse activated to get more control over the strokes.

While this tutorial should have given you a fairly basic understanding of the trunk muscles of a male torso, it really is worth researching and learning about the muscles. This will give you a much more in-depth knowledge of anatomy.

Anatomy landmarks

The anatomy landmarks are used to describe the location, to find forms and to measure proportions. You can see these landmarks in graphics to describe where the muscles are in touch with bones and where the muscles are extended through the body. When you read about the origin and insertion of muscles, you will understand where they start and end, the points of contacts with the bones, and so on. These are common terms in anatomy.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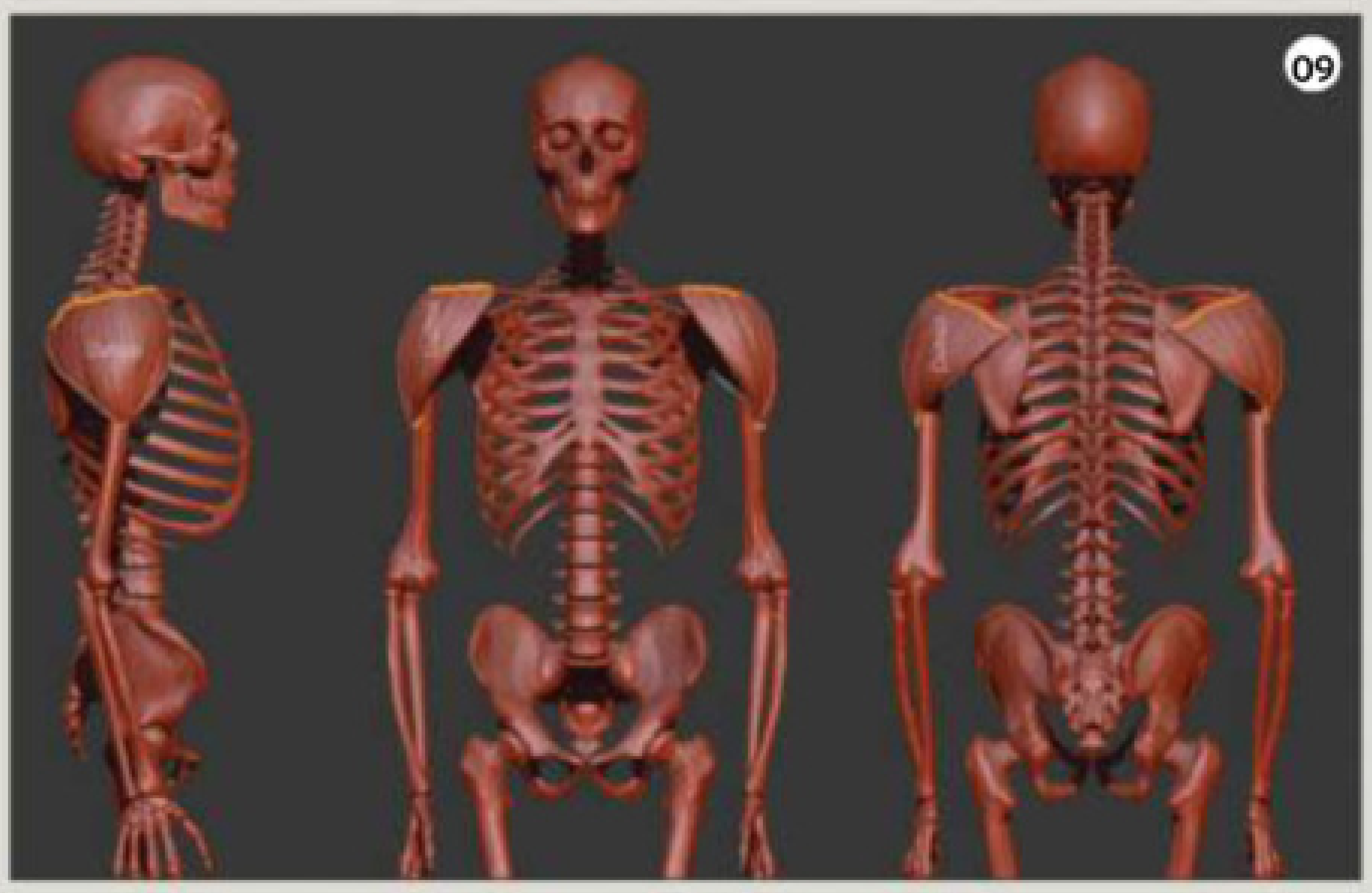
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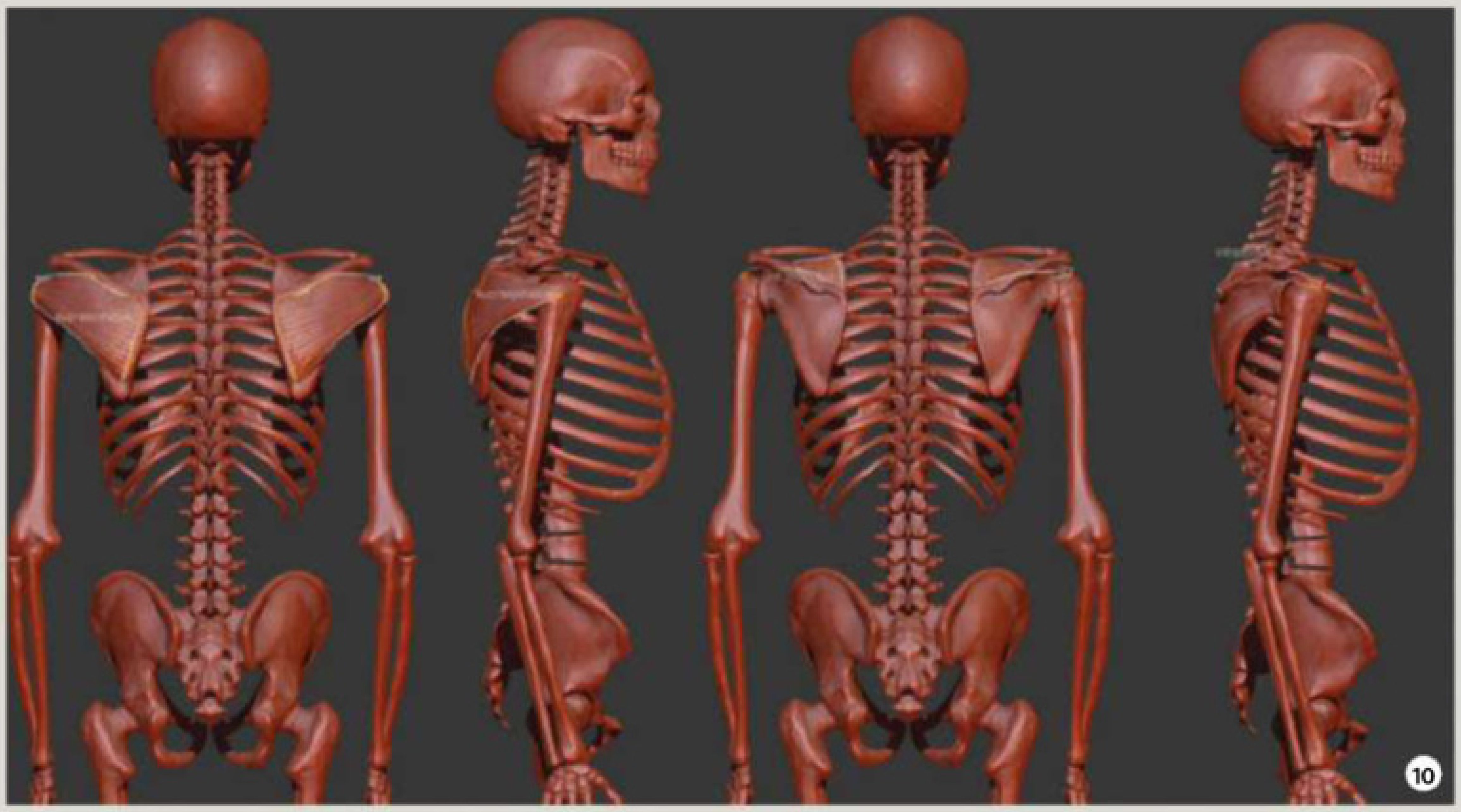
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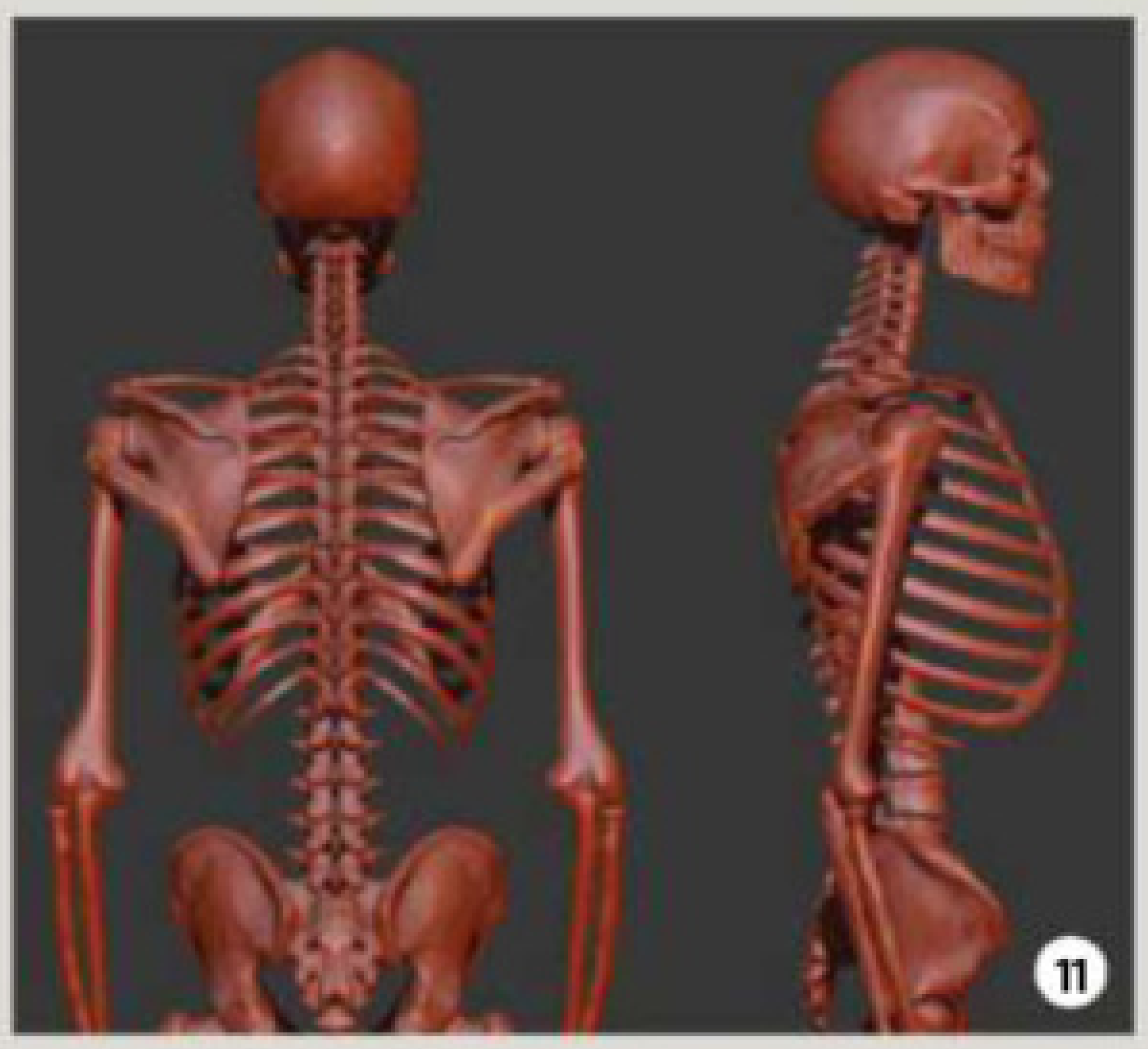
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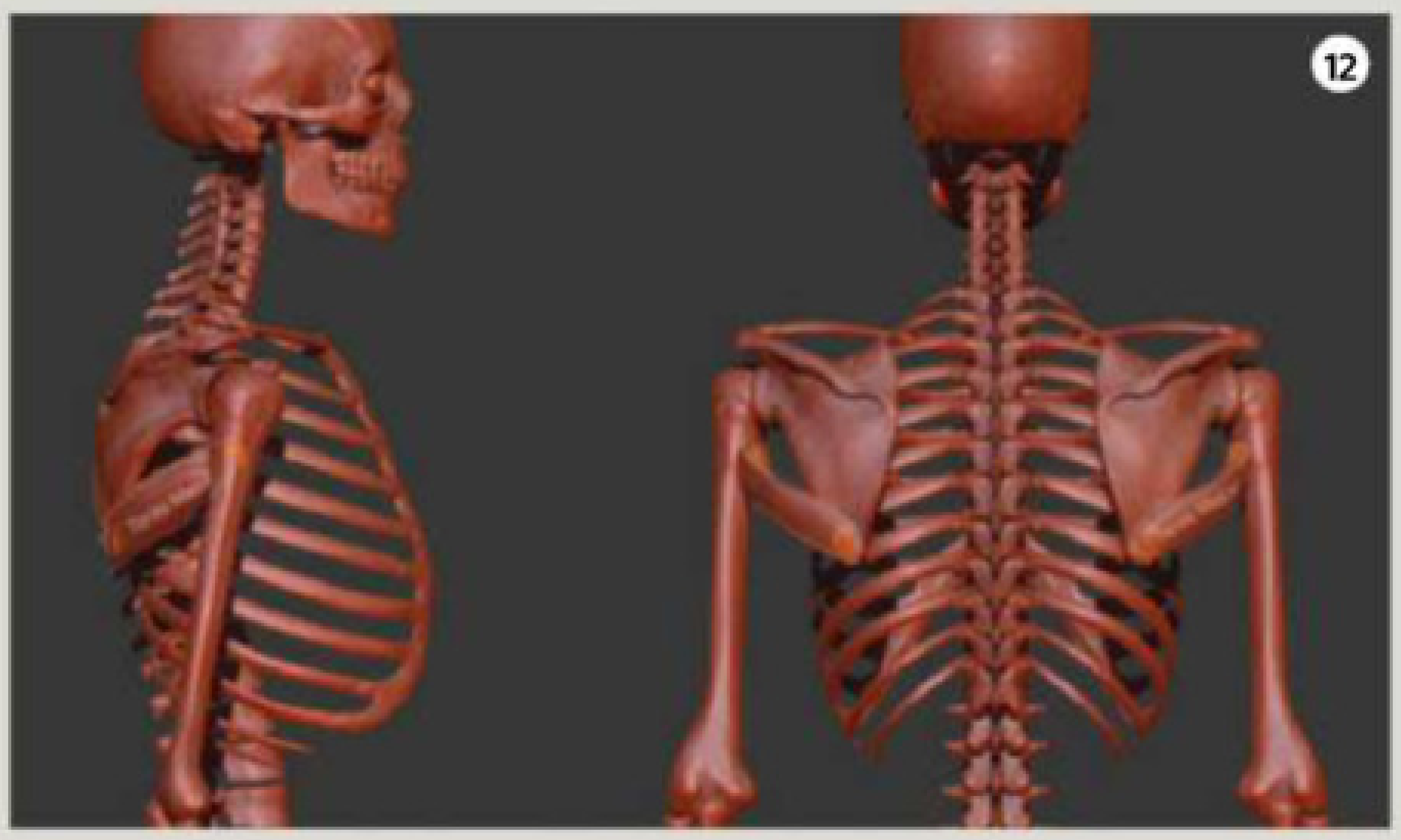
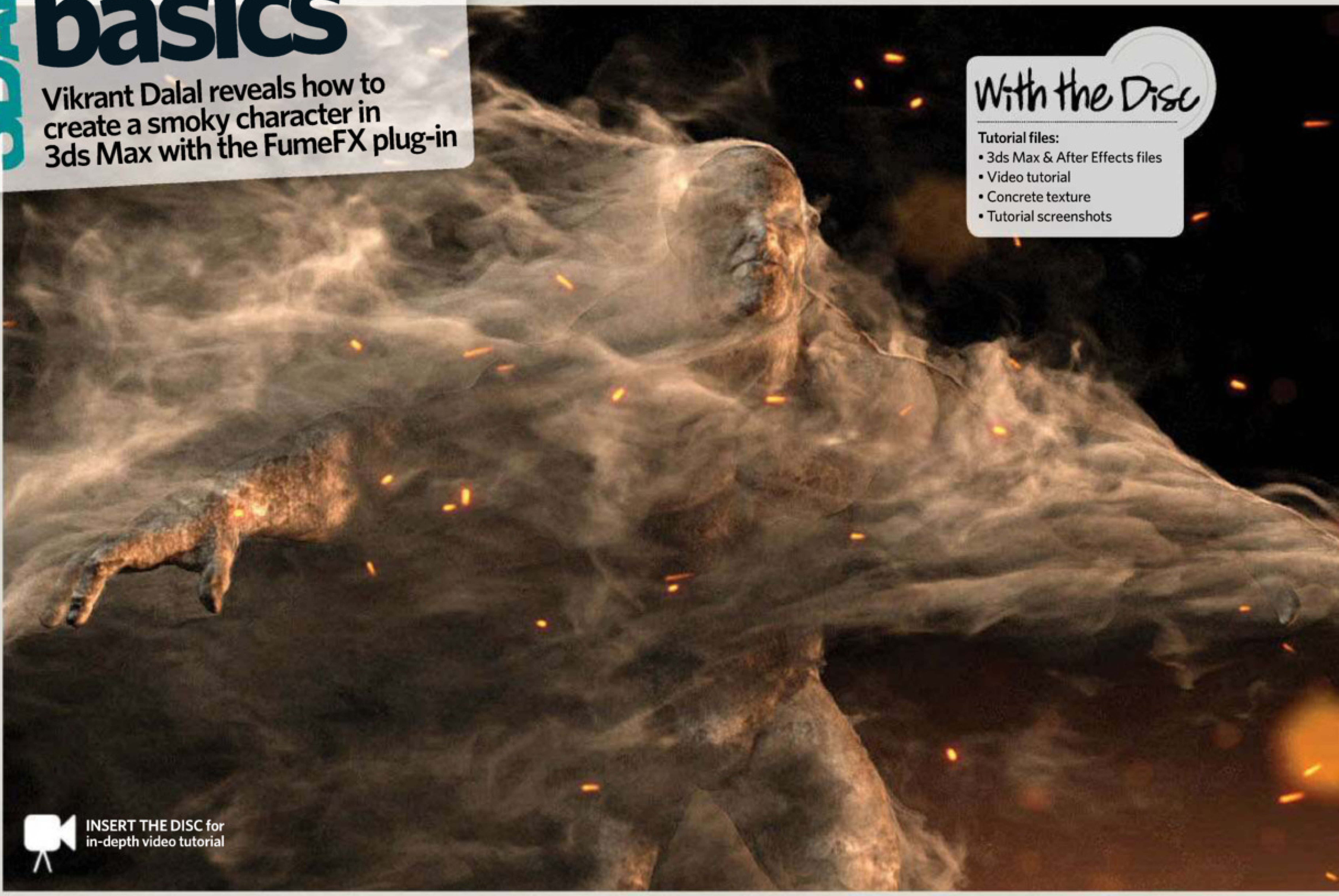

12

Vikrant Dalal reveals how to create a smoky character in 3ds Max with the FumeFX plug-in



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- Concrete texture
- Tutorial screenshots

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Create a ghost-like effect

Create ghostly characters in 3ds Max using environmental textures and the FumeFX plug-in

In this tutorial we're going to take a look at how you can make a ghostly effect for characters, such as those you see in films like *Harry Potter*, or in various videogame cinematics. You know the kind – a character with wispy trails of smoke emanating from their body, tracking every movement they make.

This can be achieved by using FumeFX and a number of tricks, resulting in an ethereal character that wouldn't look out of place in a triple-A game production or in a Hollywood film.

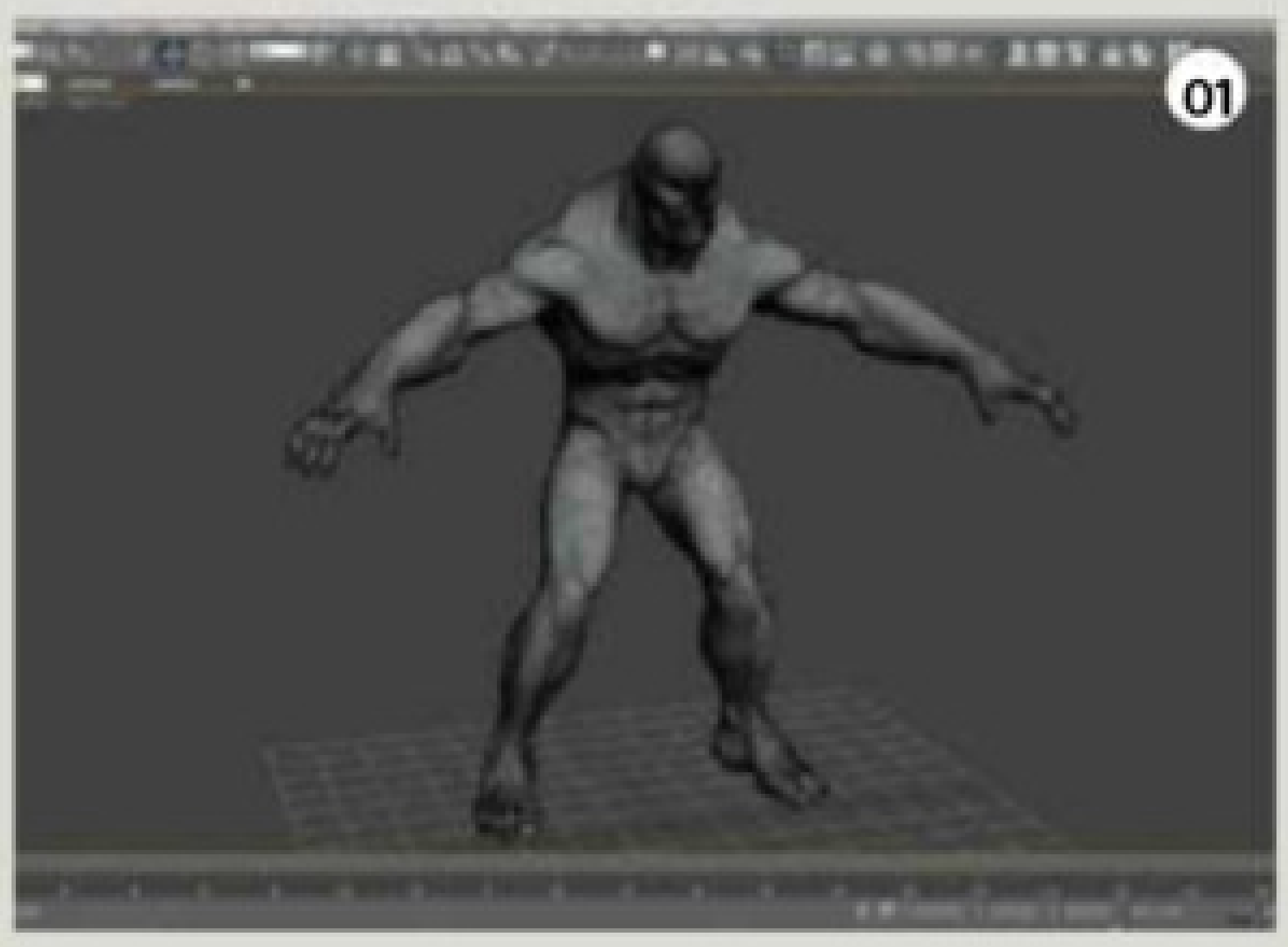
To add to the overall effect, we're not only going to focus on creating the smoky, ghostly character, but also on adding effects into the background, such as embers and a defocused fire. These kinds of elements can always enhance the look of a shot, making it more visually arresting and impressive to the viewer.

It's an interesting topic, but also a difficult one. However, I will highlight some simple steps that you can follow to streamline and simplify the process. For starters, the best way to start a project like this is to write down a list of the effects elements that your intend to use before you even start to work on the sequence. In this particular shot we are going to use a character mesh, smoke effects, embers and fire.

There's no smoke without fire...

01 Place your character geometry

To achieve our smoke effect we will need a base model of a character. If you're a good modeller you can create your own model, but if not, or you want to save time, then buy a character model online or use the 3ds Max file with the character that is supplied with this issue's disc. If you prefer you can use an animated model, but in my example I will be using a static one as it will make explaining the process easier. Place your model in the centre of the grid.



02 Apply a texture map

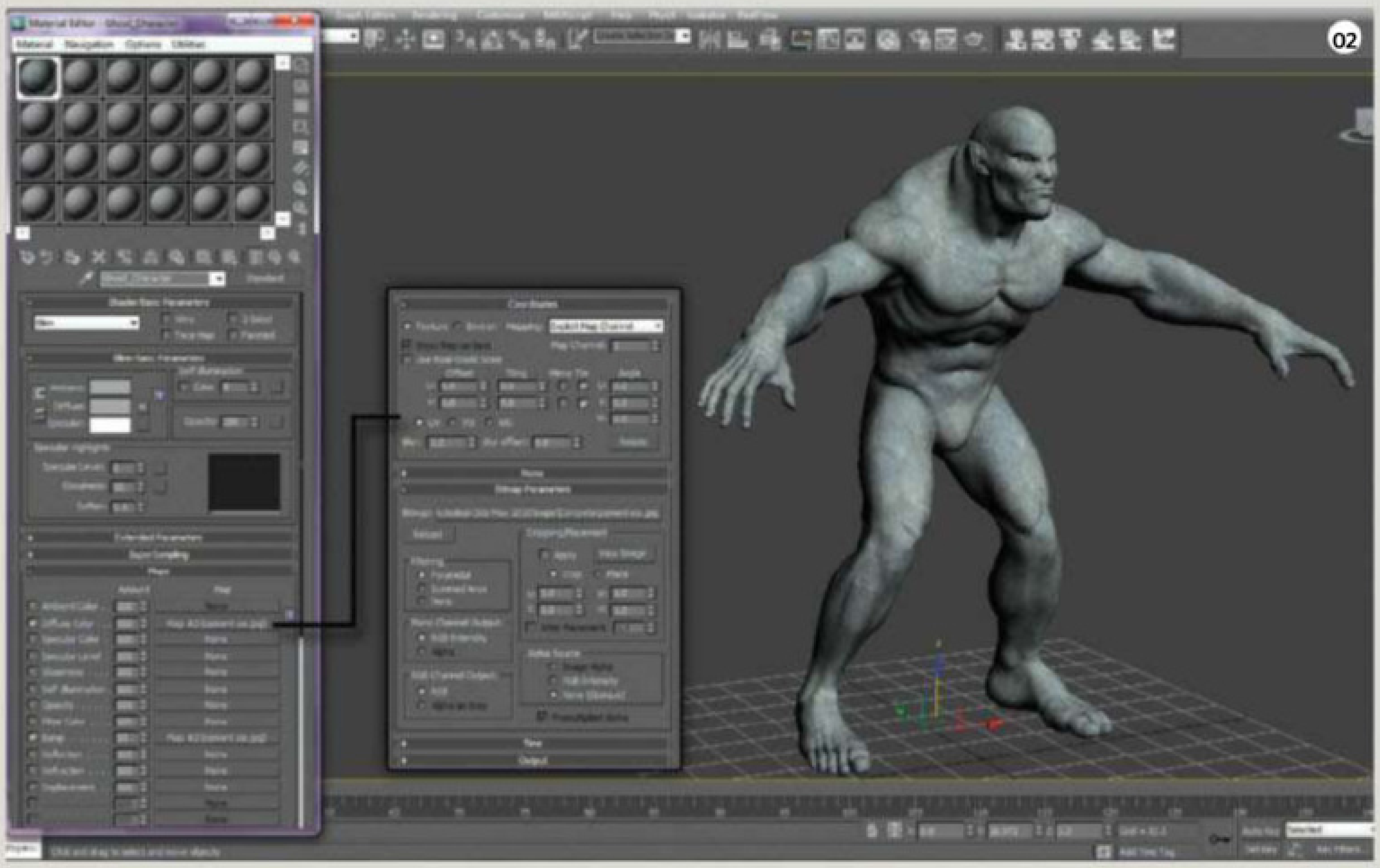
Now it's time to give our character a skin. For a good effect, look for something that is a little grungy. I found a concrete texture, which is supplied with the issue. Go to the Material Editor and assign the material, then go to the Map section and click on None. The Material/Map Browser window will appear. Click on Bitmap and select your map. We need to modify this map, so increase the Tiling to U: 5.0 and V: 5.0. Now go back to the Map section and copy and paste this map on the None button and increase the amount to 50. Now select the geometry and go to the Modify panel, select the UVW Mapping modifier and make it Box Mapping. Go to Alignment and click on the Fit button. This will set the UVW mapping to size of the geometry.

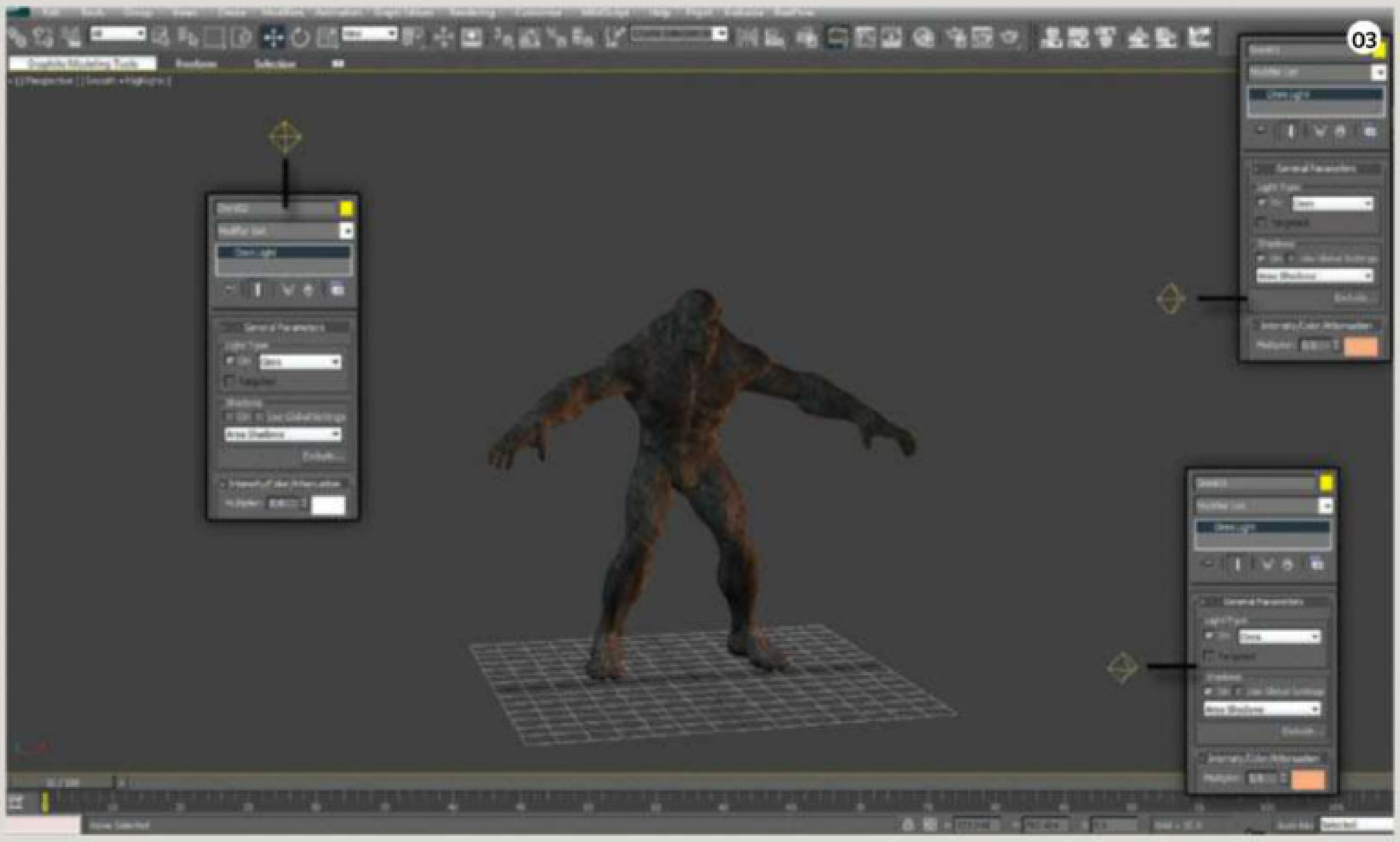
03 Set up the lights

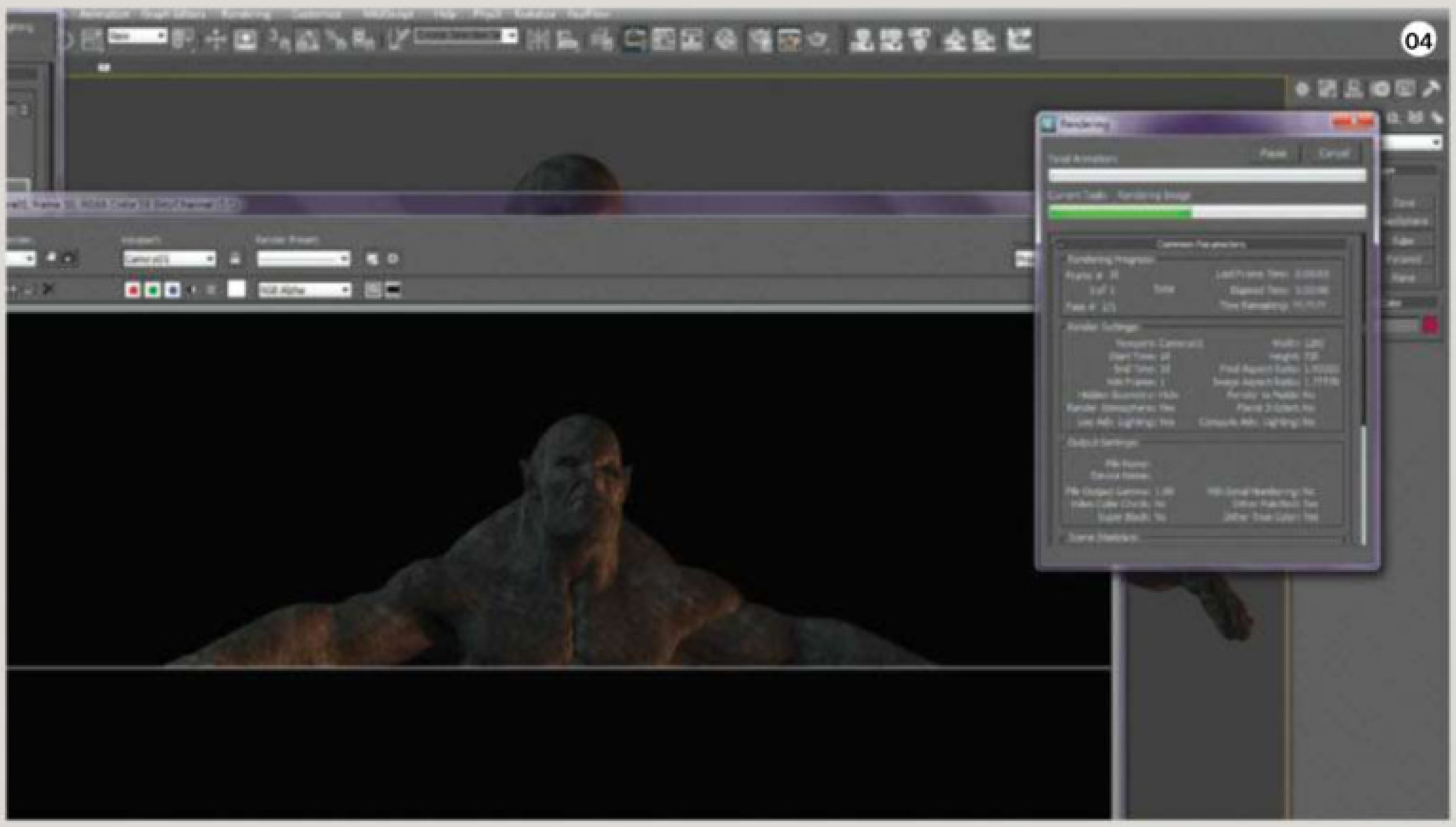
Let's place the lights that will enhance the look of character. We are going to use three Omni Lights, so let's place and modify them. For Omni01, set the Position to X: 139.891, Y: -48.117 and Z: 6.049. Set the Shadows to On, the Type to Area Shadow and the Multiplier to 0.5. The Color should be set to R: 255, G: 162 and B: 116. Omni02 should have its Position set to X: -136.499, Y: -57.067 and Z: 182.018, with Shadows turned Off, Type set to Area Shadow and Multiplier at 0.4. Color should be R: 255, G: 255 and B: 255. Last, Omni03's Position should be set to X: 157.686, Y: -43.141 and Z: 132.329 with Shadows set to On, Type to Area Shadow and Multiplier set to 0.3. Set Color to R: 255, G: 162 and B: 116.

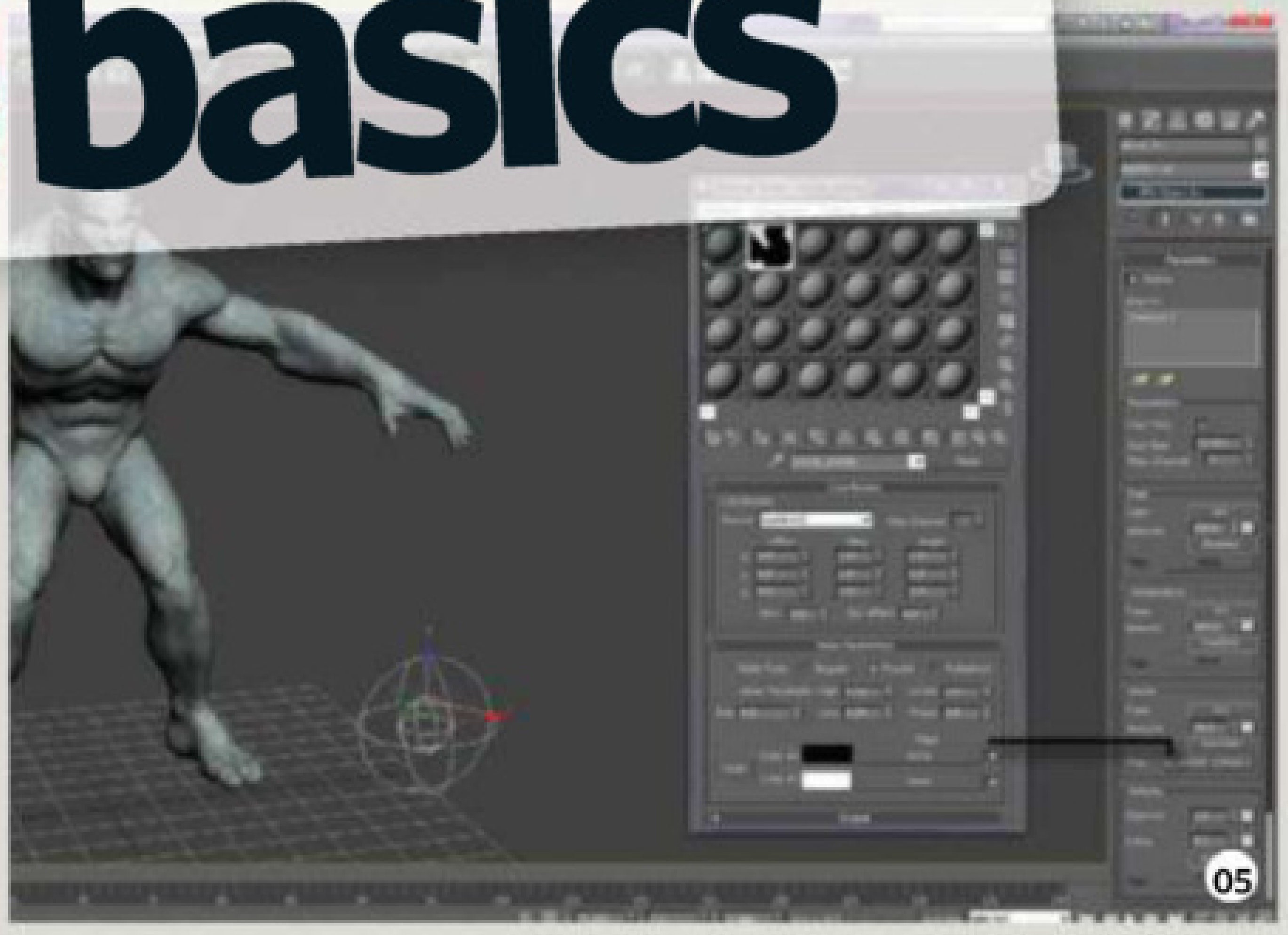
04 Render the geometry

Everything is set for rendering except the Camera. Set the Camera with the angle you intend to use, as we won't be changing it from this point onwards. Press F10 for the Render Setup menu and keep it as Default Scanline Renderer. Set the Frame Range as per your requirement and also the Output Size. We are not going to render multiple passes, so we don't need any extra modifications in the Render Setup. Save the Output Path and hit the Render button. After ten minutes we'll get our first FX element: the character mesh.





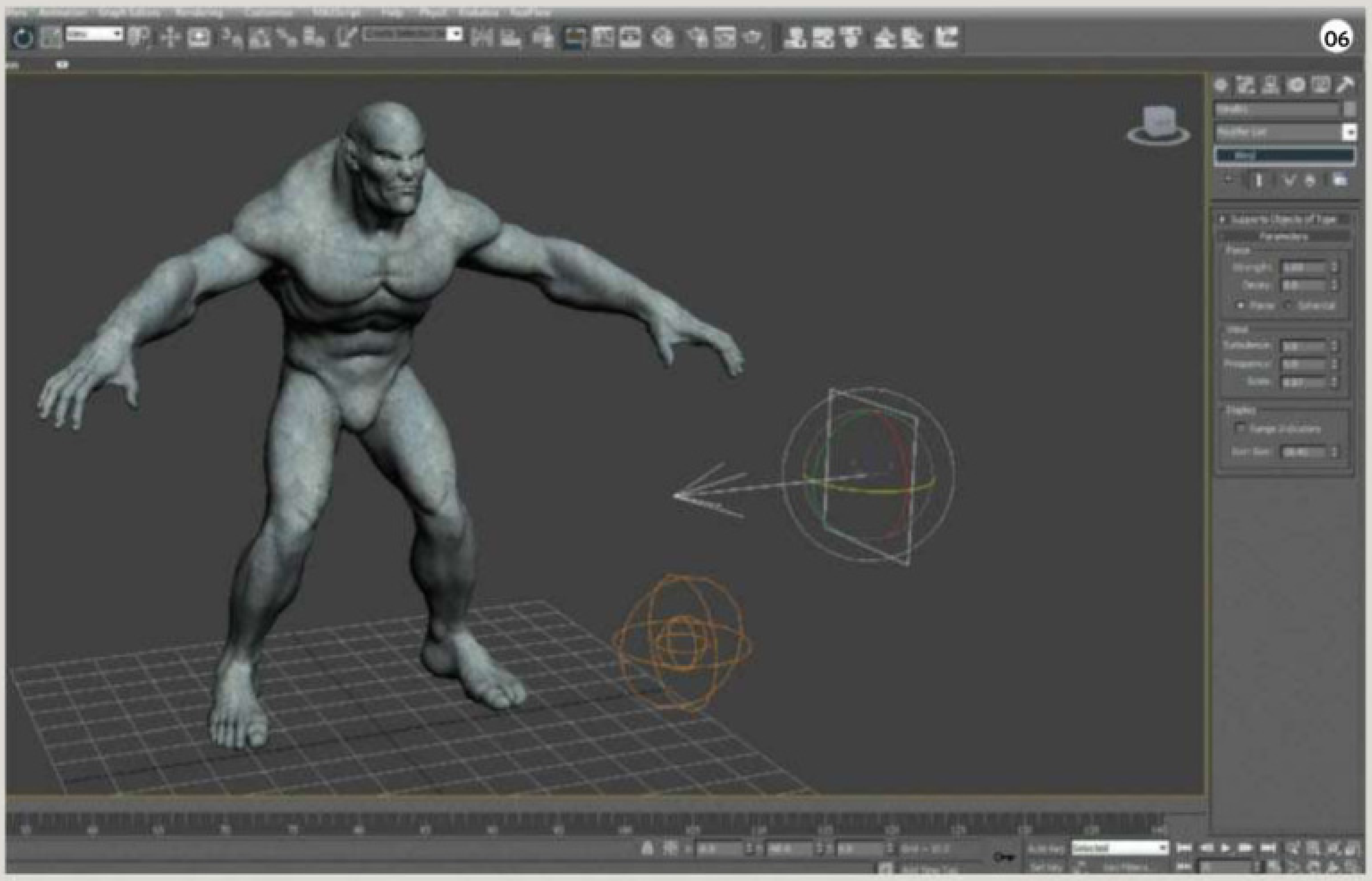




05 Create the smoke

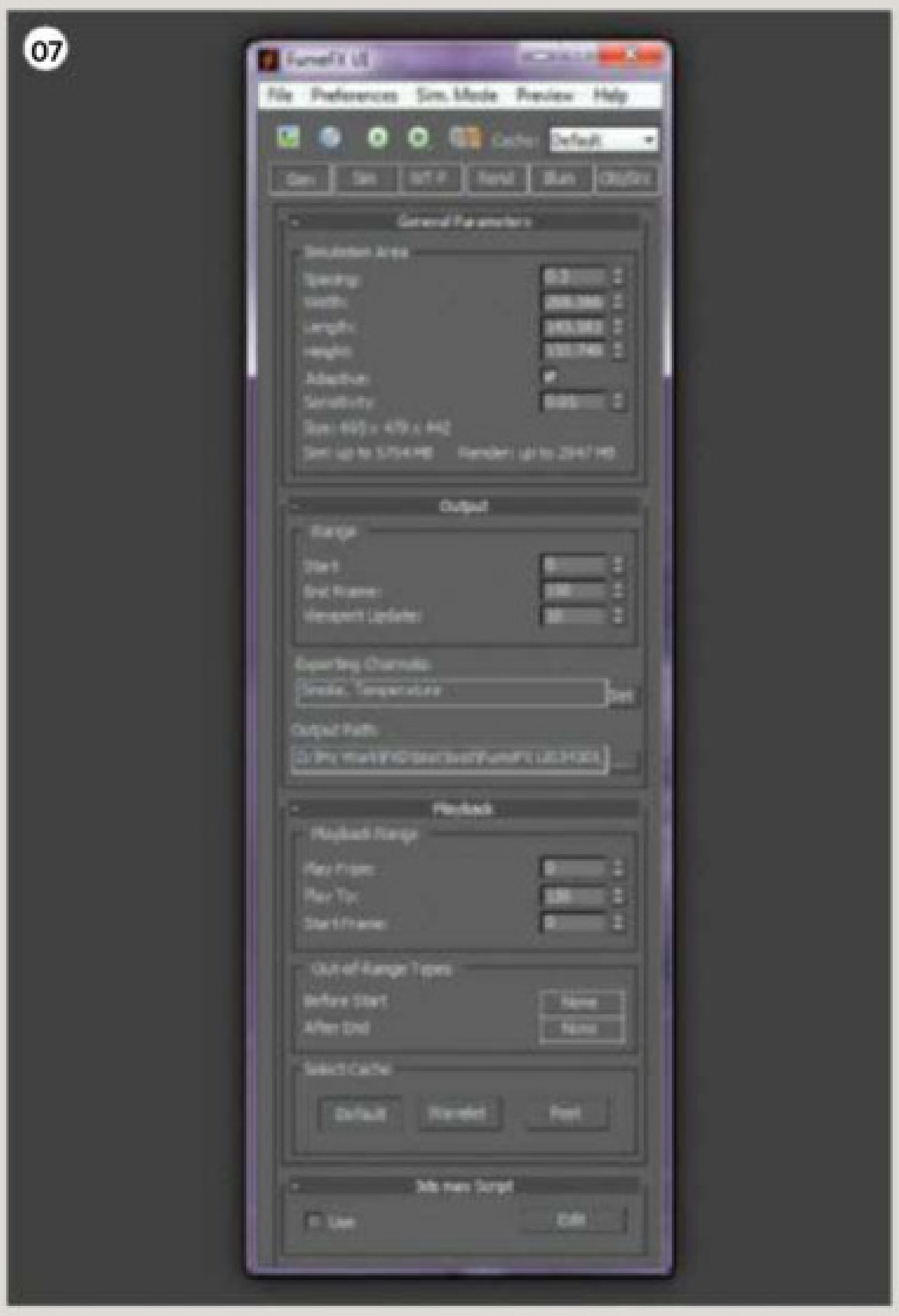
Now it's time to make our main element, which is the smoke. To create smoke we'll need three important things – a FumeFX Object Source, a FumeFX container and wind. The FumeFX Object Source is what will control the emission of smoke from the object. To create a FumeFX Object Source, go to Create Panel>Helpers, click on the dropdown menu and go to FumeFX. Click on the Object Source button and generate it in the Viewport. Now rename FFX Object Src01 to Ghost_Src. After this, select the FFX Object Src01 and go to the Modify Panel to add the character model into the Objects tab. Don't change anything in Fire or Temperature, only modify the parameters of Smoke, with an Amount set to 30.

For the map, Ctrl/right-click on the Disable button and change this to Source From Intensity. Now you can see the None button is activated. Click on this button, and from the new window select the Noise map. It will then be assigned to this button. Now open the Material Editor then select the Noise map, which is assigned on the button, and drag it onto any standard material. You will now be able see the Noise Map properties in the Material Editor. Modify them so that Noise Type is set to Fractal, Size to 3.0, Noise Threshold to High: 0.55 and Low: 0.54, and Levels set to 1.0. Make sure Phase is set to Animated from Frame 0 to 150. On frame 0 keep the phase at 0.0 and on frame 150 make it 12.0.



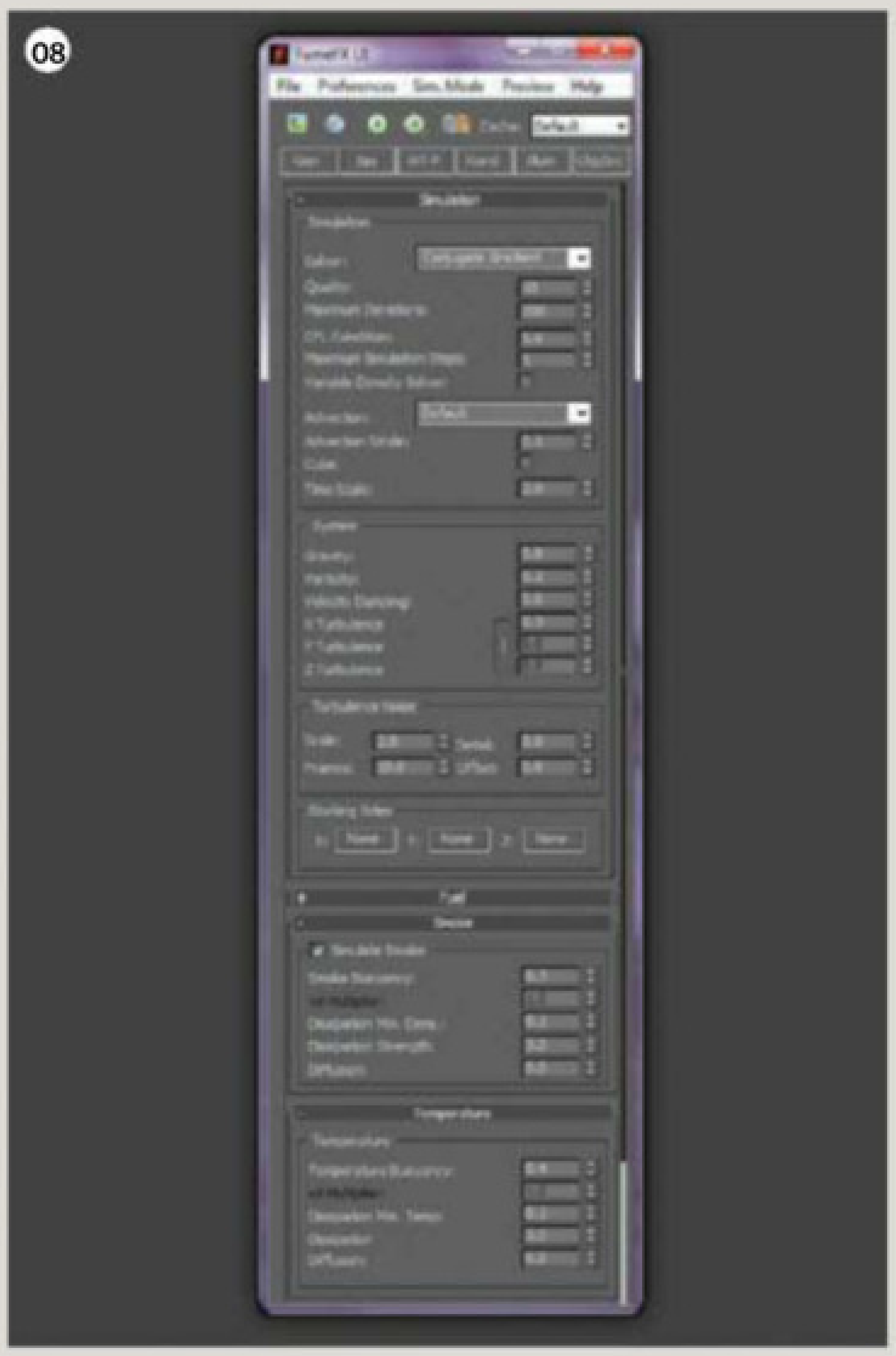
06 Add the wind

We need to give motion and direction to the smoke. The wind will change the direction of smoke according to its arrow icon. To create wind, go to the Create panel>Space Warps, click on dropdown menu and go to Forces. Click on the Wind button and generate it in the Viewport. In the Viewport change the rotation of the Wind to X: -0.0, Y: -90.0 and Z: 0.0. For the Wind parameters, change Strength to 1.03, Turbulence to 5.0 and Scale to 0.07.



07 Modify FumeFX

Now we need to modify the FumeFX container. We'll start by modifying the General Parameters, so that Spacing is set to 0.3, Width to 208.566, Length to 143.583, Height to 132.749 and Adaptive set to On. Set the Output to Start at 0 and End at 15, with Exporting Channels set to Smoke and Temperature. For Playback, set Play From to 0 and Play To to 150 with Start Frame set to 0.



08 Tweak the simulation

At this stage, the simulation needs editing. For Simulation, set Quality to 10, Maximum Iteration to 200, CFL Conditions to 5.0 and Maximum Simulation Steps to 1. The Advection Stride should be set to 0.5, with Time Scale set to 2.0. In the System section, set Gravity to 0.0, Vorticity to 0.2 and X Turbulence to 0.3. For Turbulence Noise, set Scale to 2.0, Frame to 10.0 and Detail to 5.0. All of X, Y and Z should be set to None in Blocking Sides, while the Fuel section should be turned off. Last of all, set the Smoke Buoyancy to 0.3 and Temperature Buoyancy to 0.4.

09 Rendering parameters

In this section, we can leave almost everything at default, with the exception of some of the Smoke settings. For these, set the Ambient to R:26, G:26 and B:26 with Smoke Color set to Gradient using the gradient file that you wish. The Opacity should be set to 1.0, and both the Cast Shadows and Receive Shadows boxes should be checked.

10 Illuminate the scene

Before moving forward, we need to place lights. Lights play a very important role in enhancing the look of smoke, and we can use as many lights as we want. In this case we are going to use two Omni Lights. For Omni01, set the light position to X: 157.686, Y: -43.141 and Z: 132.329. Turn on Shadows, then go to the Shadow Parameters tab and Turn on the Atmosphere Shadows, with Multiplier set to 1.0 and Color set to R: 255, G: 189 and B: 149. Keep everything else default.

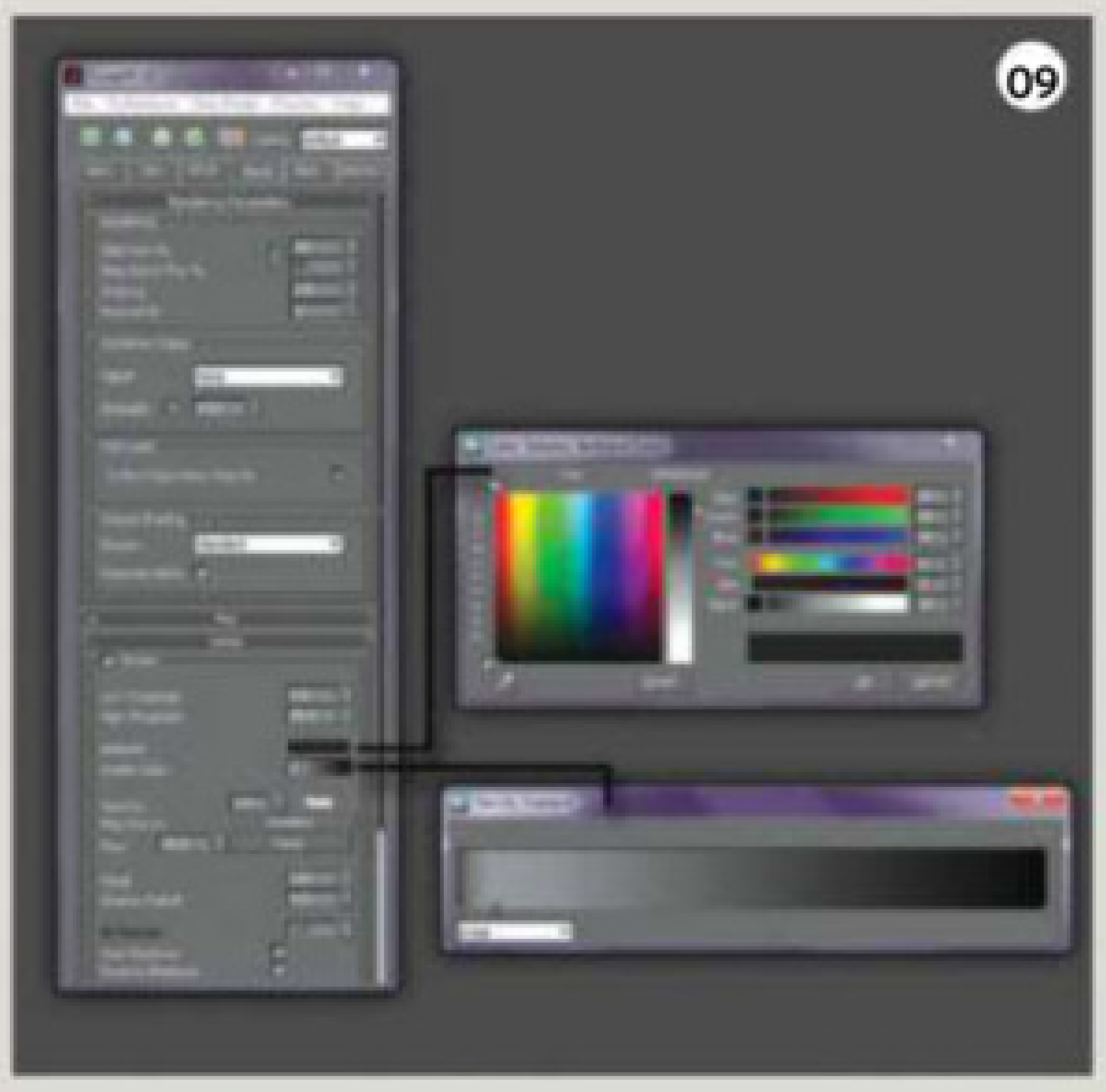
For Omni02 set the light position to X: 136.499, Y: -57.067 and Z: 182.018. Like before, turn on the Shadows and go to the Shadow Parameters tab to turn on the Atmosphere Shadows, with a Multiplier set to 0.7 and Color set to R: 255, G: 255 and B: 255. Again, keep everything else default. Add these lights to the FumeFX Illumination tab.

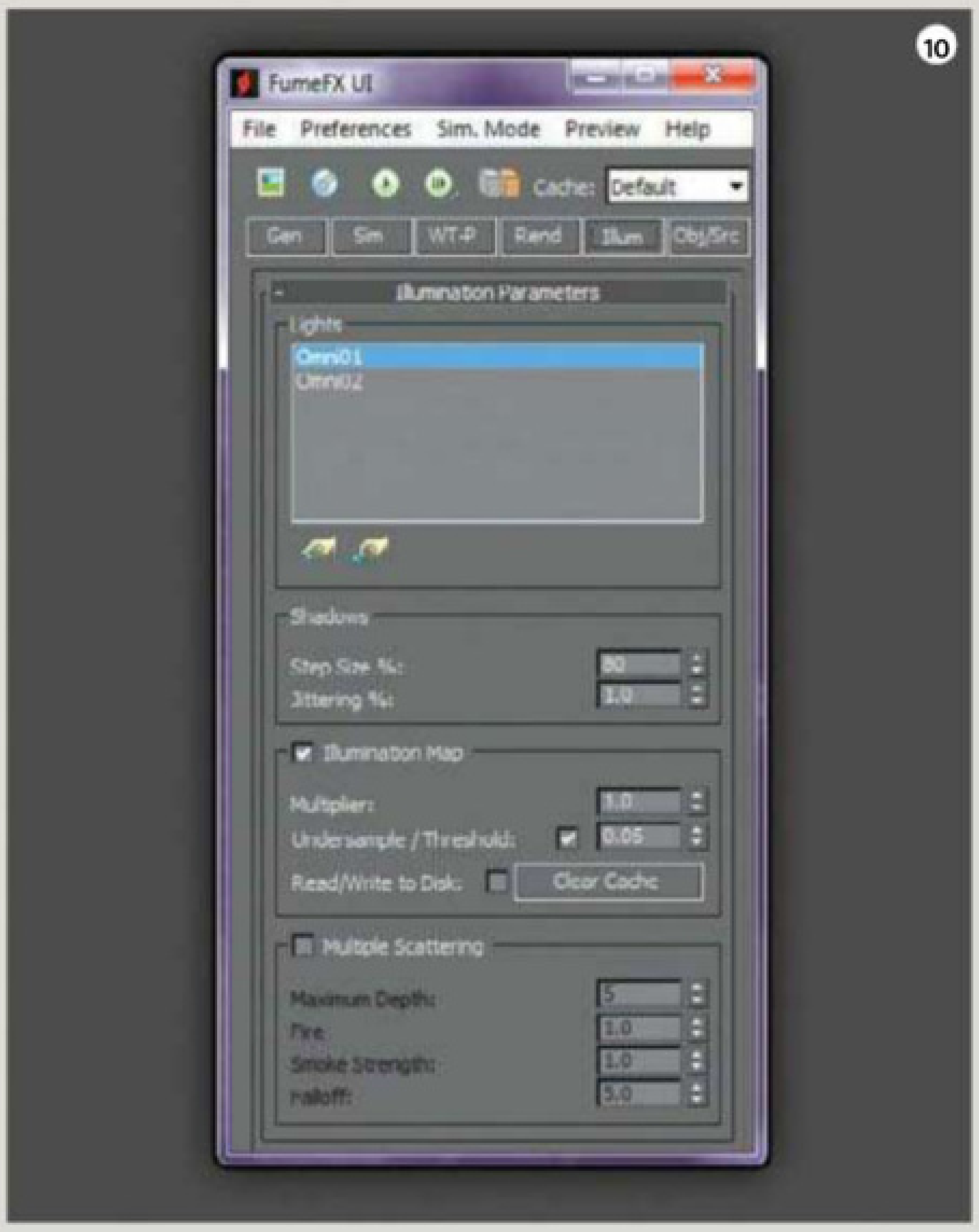
11 Start the simulation

Add the FumeFX Object Source "Ghost_Src" into the Objects>Sources> SpaceWarps tab. We have already made all necessary changes in the FumeFX Object Source, so there is only one thing that remains to be done, and that is the simulation itself. Go to General section and check the Output Path. If it's saved in the proper folder then just hit the Simulation button. It will take around five to six hours to simulate 100 frames. If you want to work with plug-ins like FumeFX and RealFlow you need a very high-end machine, because if you are working on big scene and you don't have such a machine, then the software will crash every time.

12 Render the smoke

For the final rendering of smoke we will use the Default Scanline Renderer, as we are not going to apply Global Illumination, Light Scattering or Light Bounce (however, if you want fire illumination on any object then you have to use a program like V-Ray or Final Render). To render the smoke element, press F10 and the Render Setup window will appear. Set the Frame Range and Output Resolution as you wish. Now save the Render Output Path, and then go to the Render Elements section and click on the Add button. Another window will appear where you can see the list of render elements, so select FumeFX Smoke. This means that only the smoke will render, not a single mesh. It's the best option to render fire or smoke with geometry matte, without applying matte material to objects. Hit the Render button and, after a bit of a wait, we'll get our second FX element: the smoke.





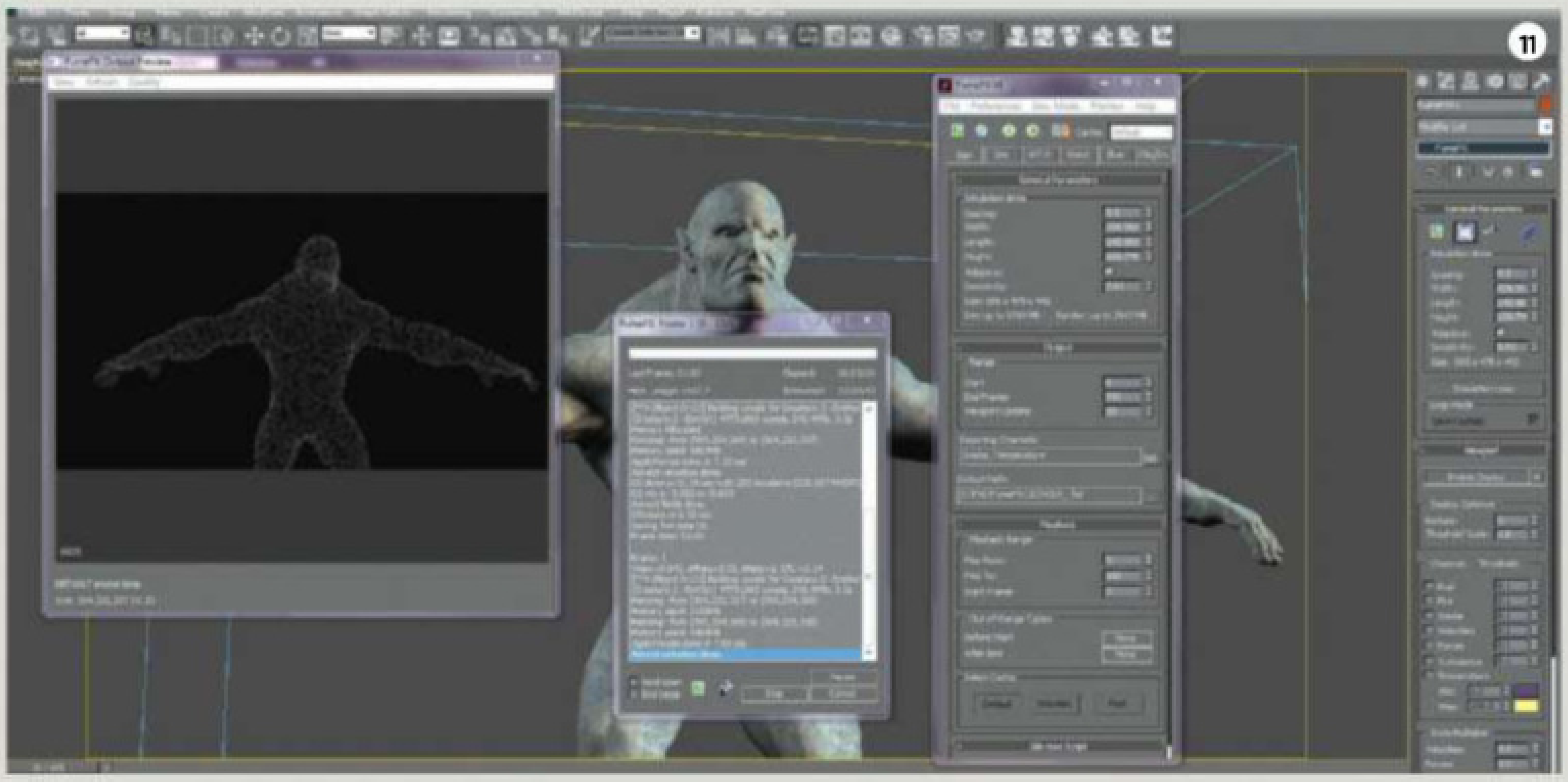
Cache: Default

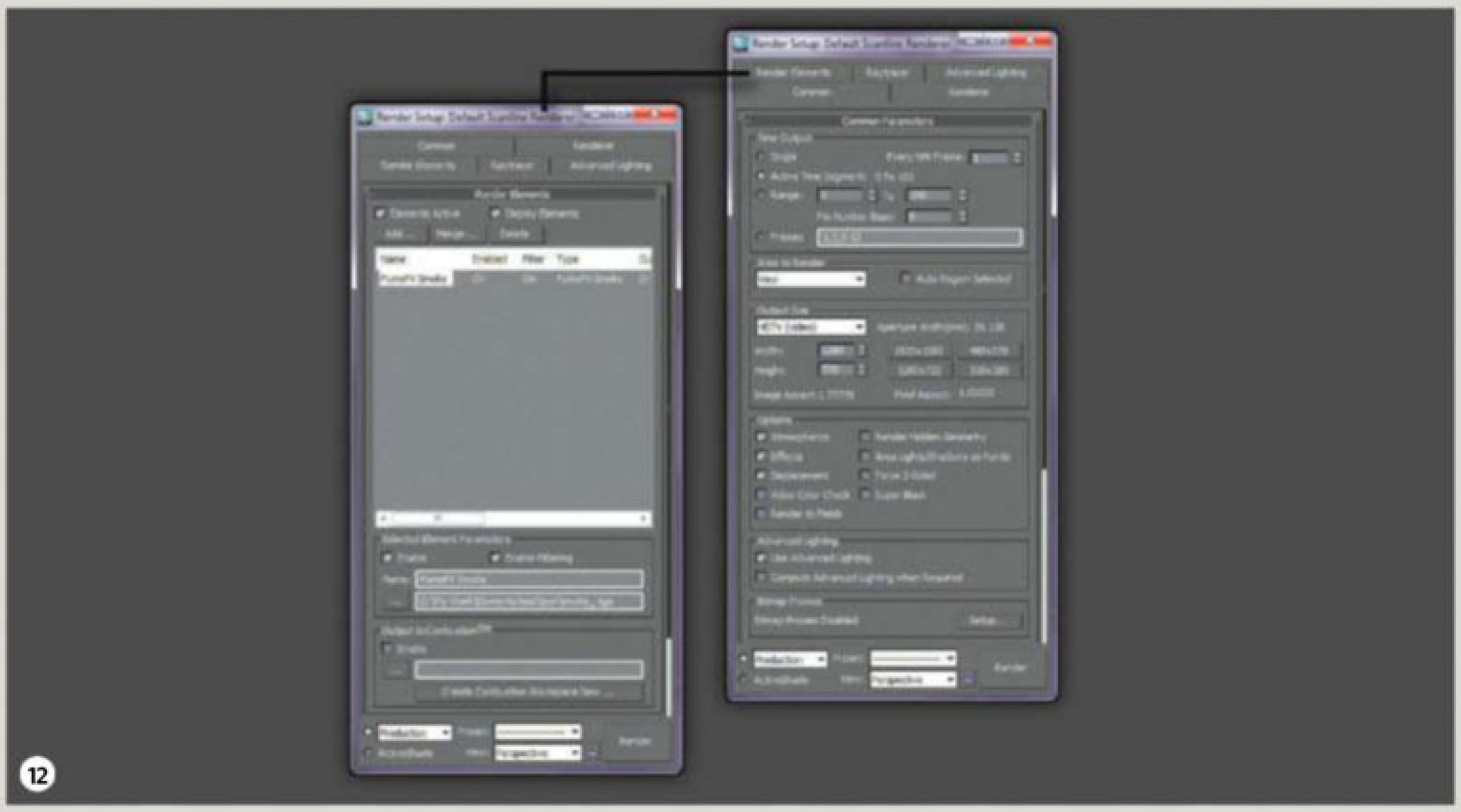
Lights
Omni01
Omni02

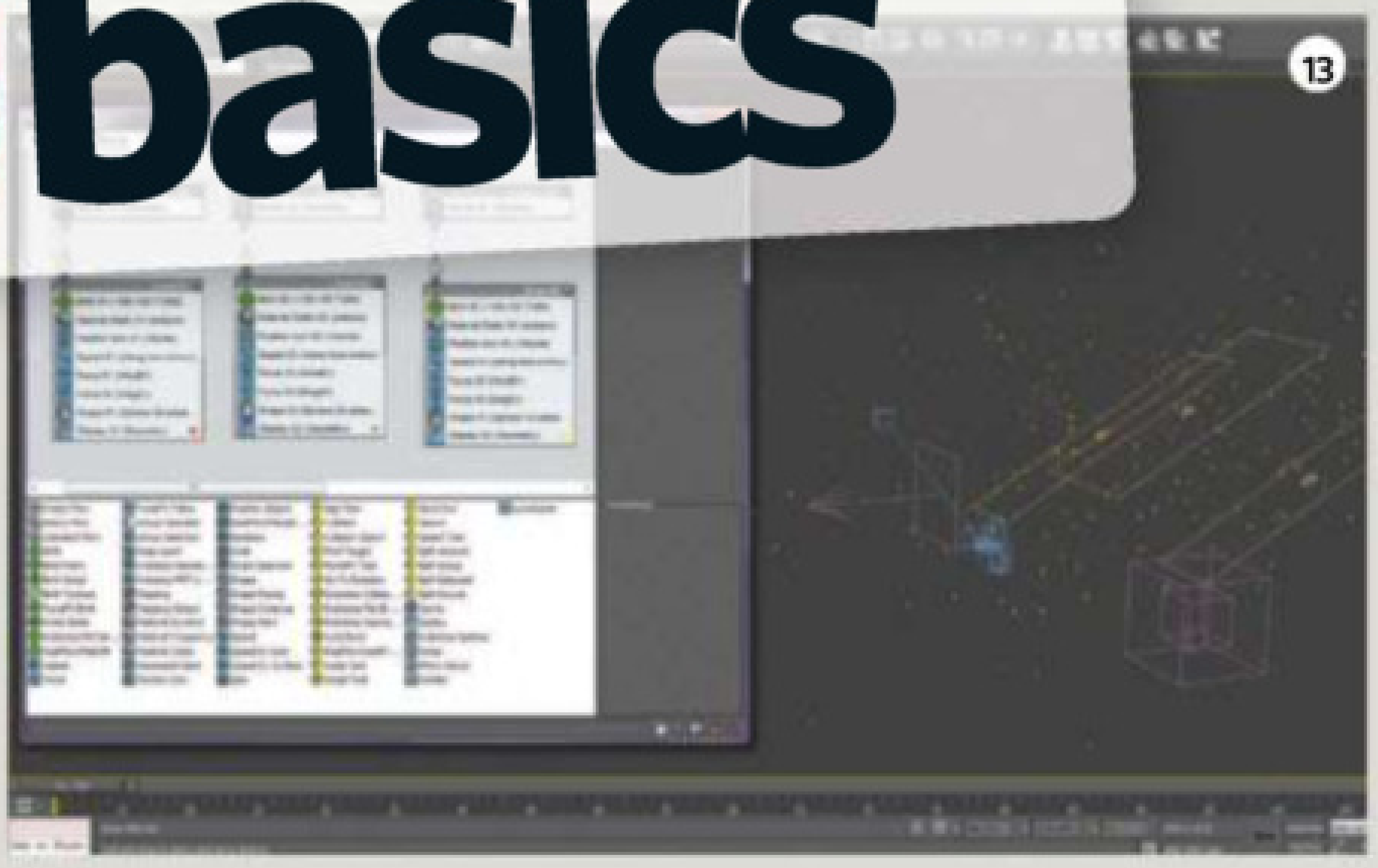
Shadows
Step Size %: 80
Jittering %: 1.0

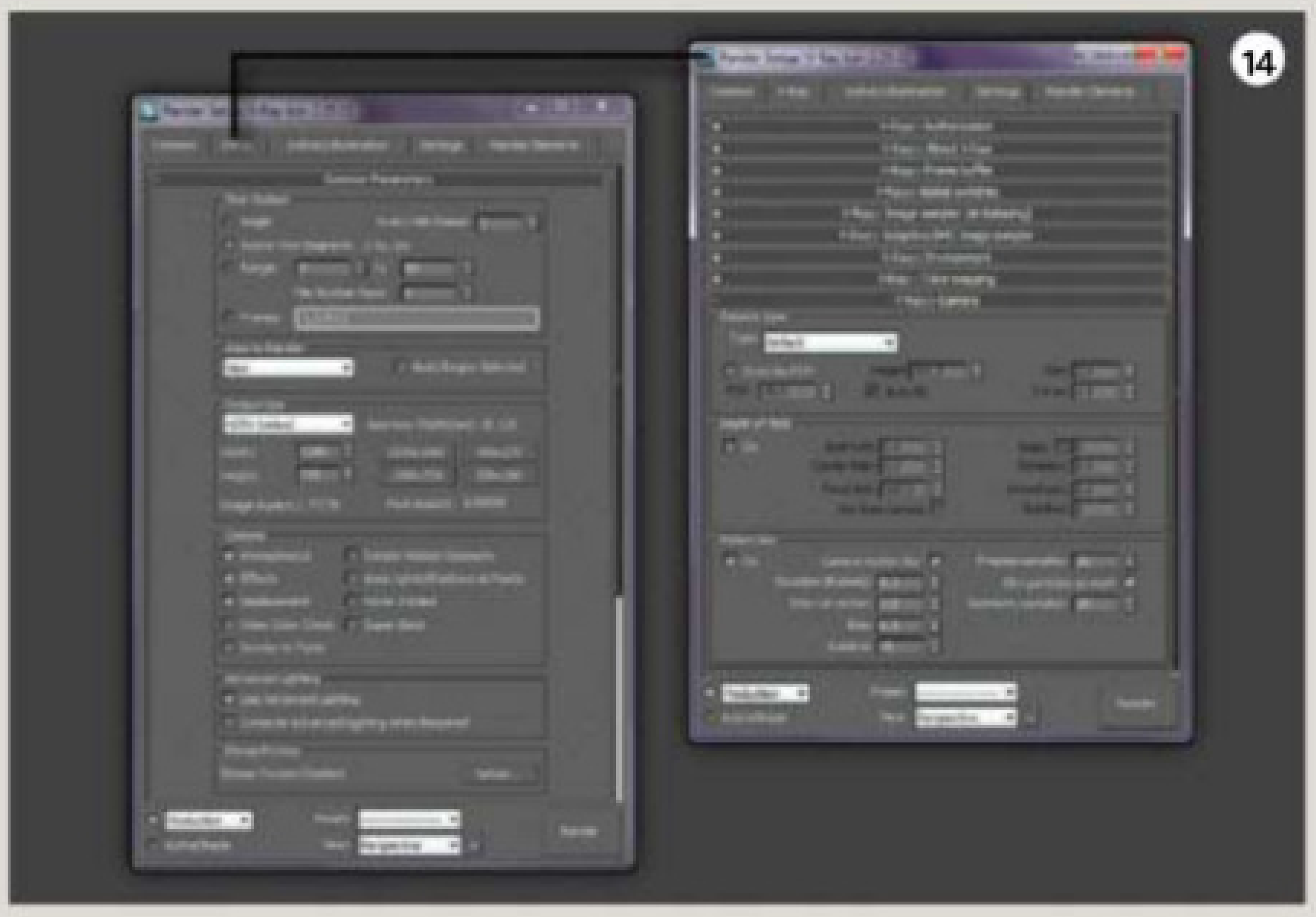
☑ Illumination Map
Multiplier: 1.0
Undersample / Threshold: ☑ 0.05
Read/Write to Disk: ☐ Clear Cache

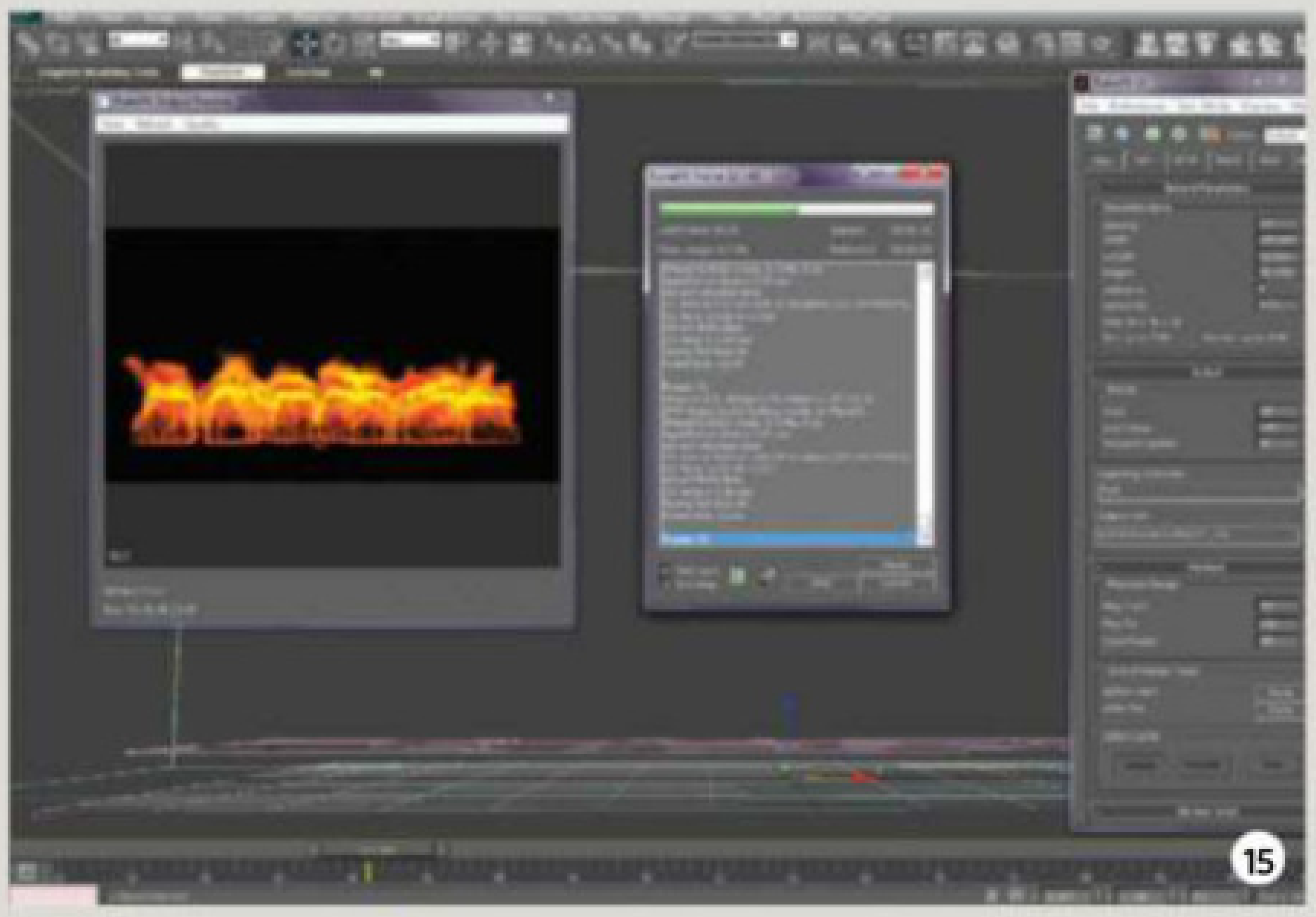
☐ Multiple Scattering
Maximum Depth: 5
Fire: 1.0
Smoke Strength: 1.0
Falloff: 5.0











13 Use Particle Flow

It's now time to make the embers. We'll use a Particle Flow system, which provides strong particle control. We will make three layers of embers for the foreground, mid-level and background.

To open Particle Flow, press 6. You will see a window called Particle View. Here we will make single layers of embers and copy them into the foreground and background. Create the standard flow by dragging the Standard Flow system from Depot to the Event Display area. You will see the PF Source 01 appear in the Event display. For this, assign Birth between -150 to 100, Speed to 75 and Variation to 50, with Force Wind set to 700 and Force Drag at 300. Shape should be set to Sphere 20 Sides with a Size of 0.7, Scale of 100 and a Variation of 50. Material Static should be set to Ember Material, while Display should be set to Geometry.

At this point, go to Viewport and select the PF Source 01 and change its Position and Rotation according to the camera view. Try to keep the right-side out of the camera, so we can see that the embers are travelling from right to left.

Now go to Space Warps>Force, select Wind and Drag Space Warps and add them in the Viewport. Select the Wind and place it near PF Source 01, rotate it, then modify its parameters. Select Drag and place it anywhere. Set the Wind's Strength to 0.1, Turbulence to 0.7, Frequency to 1.0 and Scale to 0.04. For Drag, set the Time In and Time Out to -100 and 200 respectively, with Linear Damping set to X: 20, Y: 77 and Z: 20.

Now let's work on the Material. Press M and select any standard material and modify its parameters so that Ambient and Diffuse Color is set to R: 255, G: 132 and B: 0. Set the Specular Color to R: 230, G: 230 and B: 0, Self-Illumination to 94 and Specular Level to 55.

Select this standard material and drag it into the Material Static operator. Go to Particle View and select PF Source 01 (All Events) and make two copies, because we want to place them in the foreground and background. After this go to the Viewport and select a new PF Source one by one and place them in the foreground and background of the Camera View.

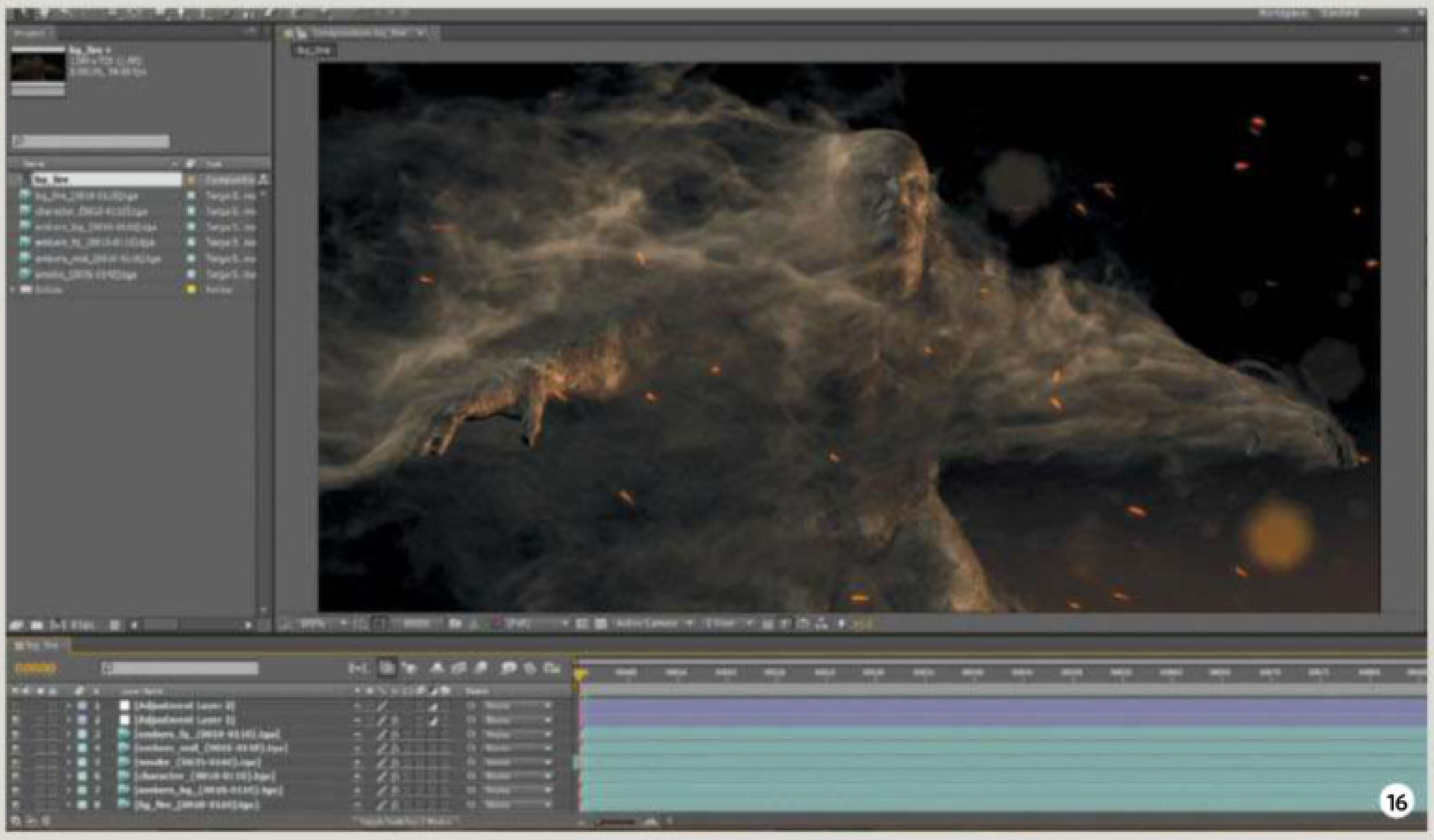
14 Render the embers

This time we are going to change our renderer from Default Scanline to V-Ray, because we want to get proper motion blur for our embers. Go to the V-Ray tab to select V-Ray: Camera and turn on the Motion Blur. Set the Duration to 0.7, Interval Center to 1.0, Bias to 0.5 and Subdivs to 10. Set Prepass Samples to 10, turn Blur Particles As Mesh on, with Geometry Samples set to 10.

Like our PF Source, we're going to render three separate layers of embers. We are going to render them separately, so we'll need to turn off the other two PF Sources. Set the Frame Range, Resolution and Output Path and press Render. You now have your third VFX element: the embers.

15 Make fire with FumeFX

We need to make the final FX element – the fire. Don't waste time making overly detailed fire, because we are only going to use it in background and defocus it. Create a new FumeFX Container and in Simulation, turn off Smoke. Don't use any light, as we won't need lights to render fire. Add FFX Simple Sources in different places with different sizes and simulate the fire with low spacing, as we don't want to spend too much time on simulation and rendering.

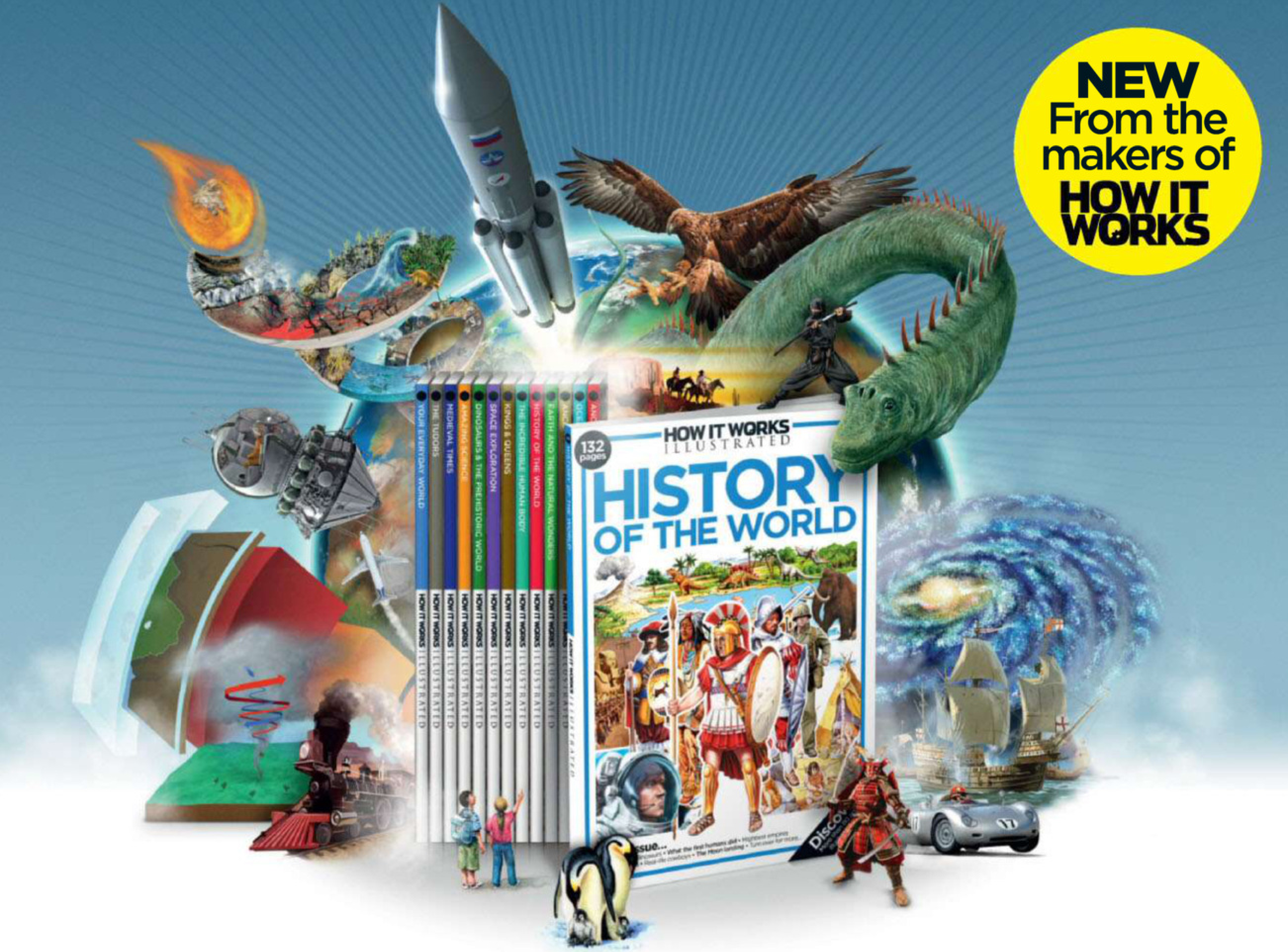


16 Post-process with After Effects

We can now compile our elements in After Effects, compositing them together to achieve a better look. Open After Effects and import all of the elements. Load these layers into the timeline in the sequence seen in the accompanying image and apply any effects that you think will look good. In short, what we want to do now is to really enhance what has already been created to give it a more realistic look.

At this point you can experiment and try out new ideas. You'll need to remember to insert and process the fire, the three levels of embers (background, mid-ground and foreground), the character and the smoke.

• **DID YOU KNOW?** • All tutorial files can also be downloaded from: **www.3dartistonline.com/files**



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Technique focus

Incredible 3D artists take us behind their artwork

LIGHTING There is a VRLight placed outside the window in the scene to simulate daylight. The colour of the light is 6500 colour temperature. I used another VRLight on the left side of my scene with some changes to the parameters – for instance I set the intensity into negative values so that side of the scene seems darker. The sun is simulated by a Direct light. **One Day,** 2014

XiaoFei Peng
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Username: pxfpxd

Email
29144137@qq.com
Country China
Software used 3ds Max, Photoshop, V-Ray

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Lino Grandi

www.lightwave3d.com

Lino Grandi is a 3D generalist who specialises in character animation. He is currently working as a developer and a tester for the LightWave 3D Group

ZBrush, Maya

Adam Ball

www.polyhammer.com

Adam is lead artist at Evil Aliens, an indie company that is currently developing *Orbitor*, coming soon to PS4. He teaches at the Academy of Interactive Entertainment

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Animate faces with Kinect

“How do I drive the facial performance of my character using the Microsoft Kinect and NevronMotion for LightWave?”

As any animator will tell you, animating the facial expressions of a character can be quite a tedious task. There are thousands of subtle movements in even the most simple of facial expressions that can make the difference between a plunge down the uncanny valley or clear sailing across the gap. The slightest movement of the eyelids or turn of the mouth can make the difference between a loving glance and a hateful sneer.

As such, many 3D artists are looking for alternatives to hand-keyed animation to make the task faster, easier and more efficient. One option is motion capture, which allows the artist to drive the performance of the characters themselves.

NevronMotion by the LightWave 3D Group can assist greatly in this by enabling the animator to puppet the character's body and face using Microsoft's Kinect device. With NevronMotion, users can load common motion-capture files in FBX or BVH format and easily retarget the motion onto their character directly in LightWave Layout. You can quickly adjust any of the character rig joints in areas like the shoulder or arms to compensate for any joint placement inaccuracies and bake out your final animation directly to your character rig.

Of course, before you get started you need to make sure that your equipment is prepared correctly. In this tutorial, we'll demonstrate how to properly set up the nodal controls for controlling a character's head, as well as the facial expressions. Be sure to check out the accompanying video tutorial for more details.

01 Install NevronMotion

NevronMotion is a plug-in for LightWave 11.6+ that is currently only available on Windows OS. Once downloaded, it will be supplied to you as a ZIP archive. Copy the NevronMotion folder to C:\ProgramFiles\NewTek\LightWave11.6\support\plugins. You can now access the NevronMotion retargeting interface by launching Layout and going to Utilities>Master Plugins. If you look in your account, you'll also notice you have a download for the Kinect for Windows driver. Download and install the driver, then connect your Kinect to your computer. To launch the video display and see all the Kinect options, go to Virtual Studio>Device Manager. You should see Kinect For Windows under the name category, so enable it and your Kinect will show up. Enable that too, then click Open to open the video display interface.

3ds Max, V-Ray

Ângelo Fernandes

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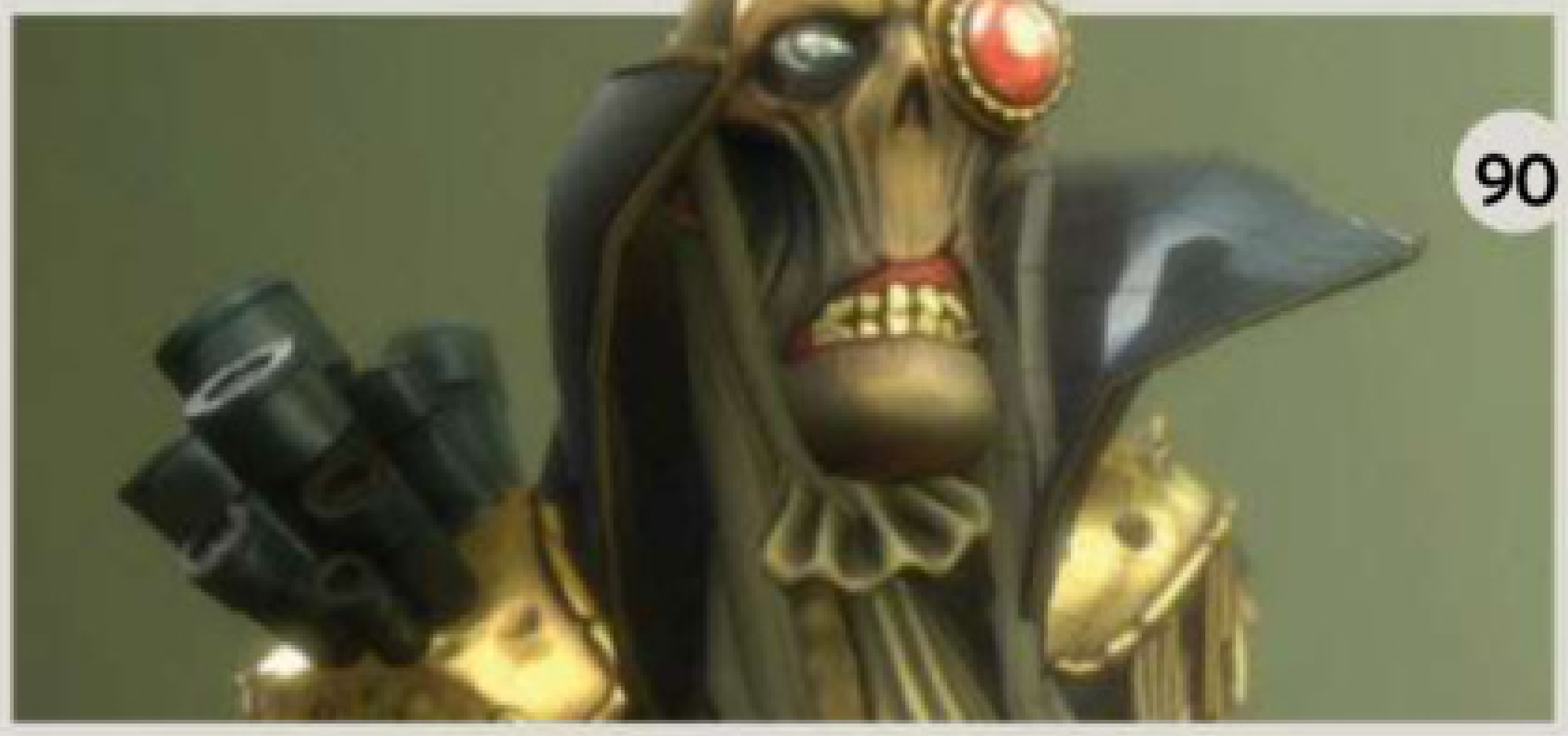

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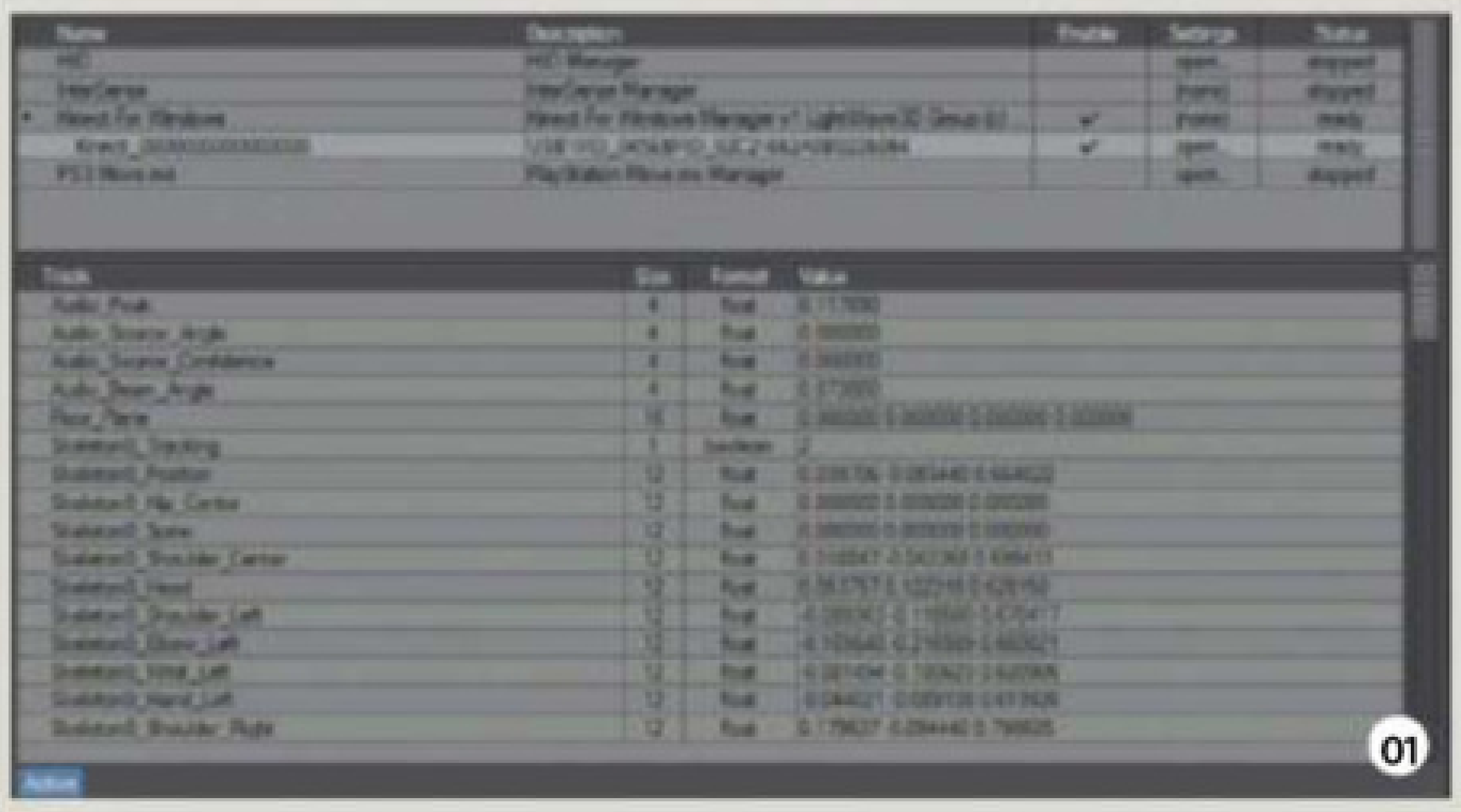
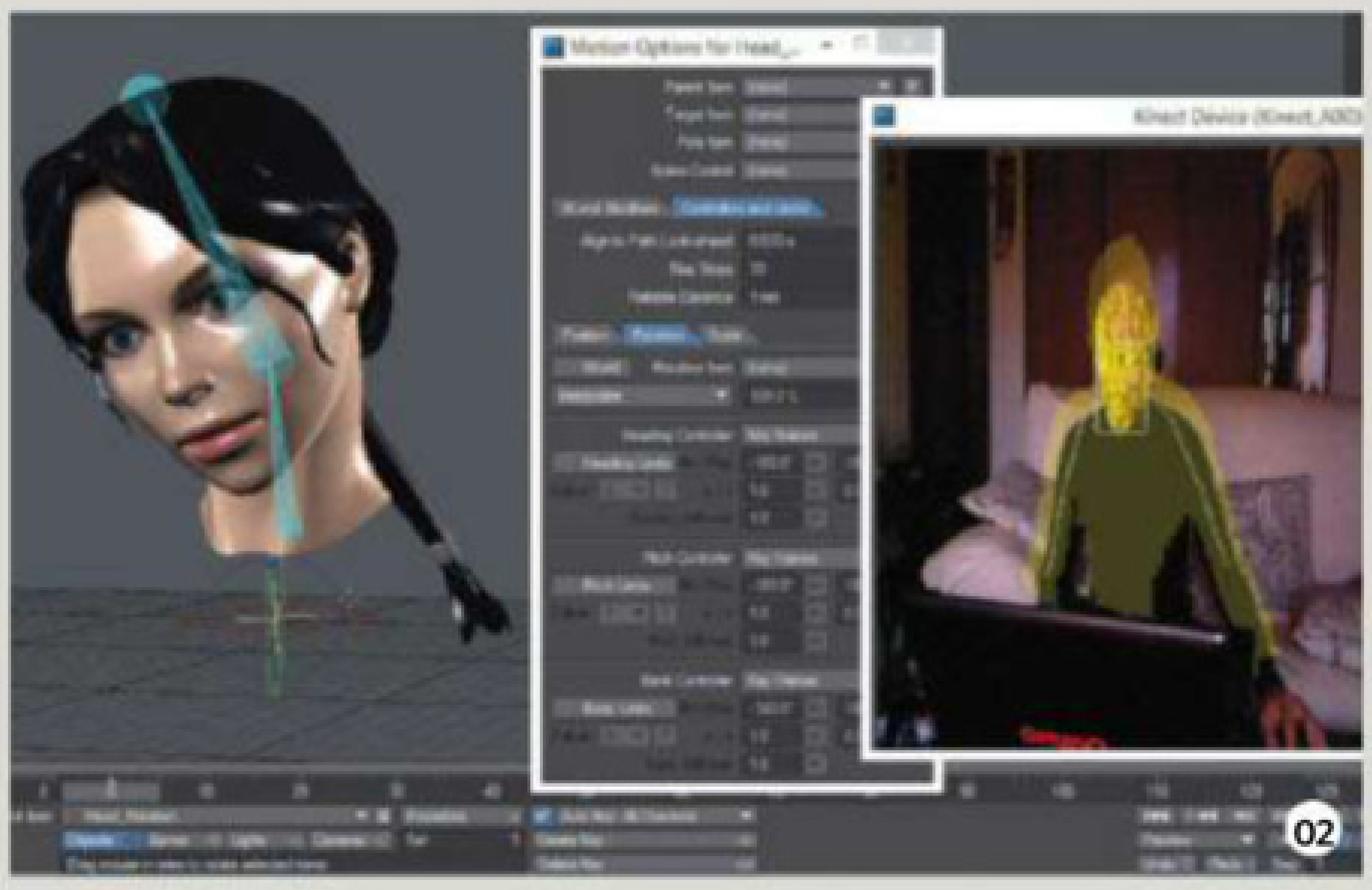
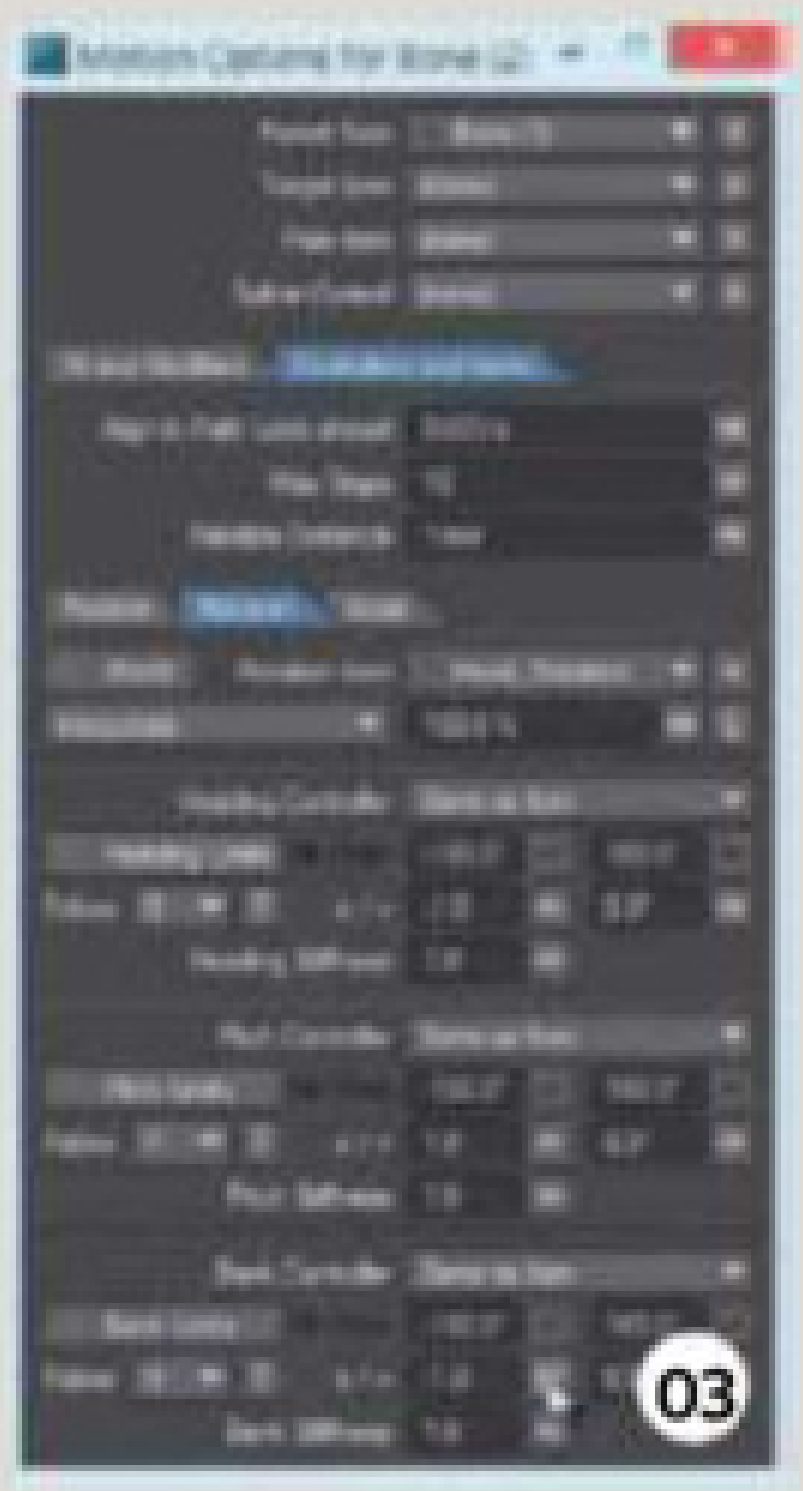
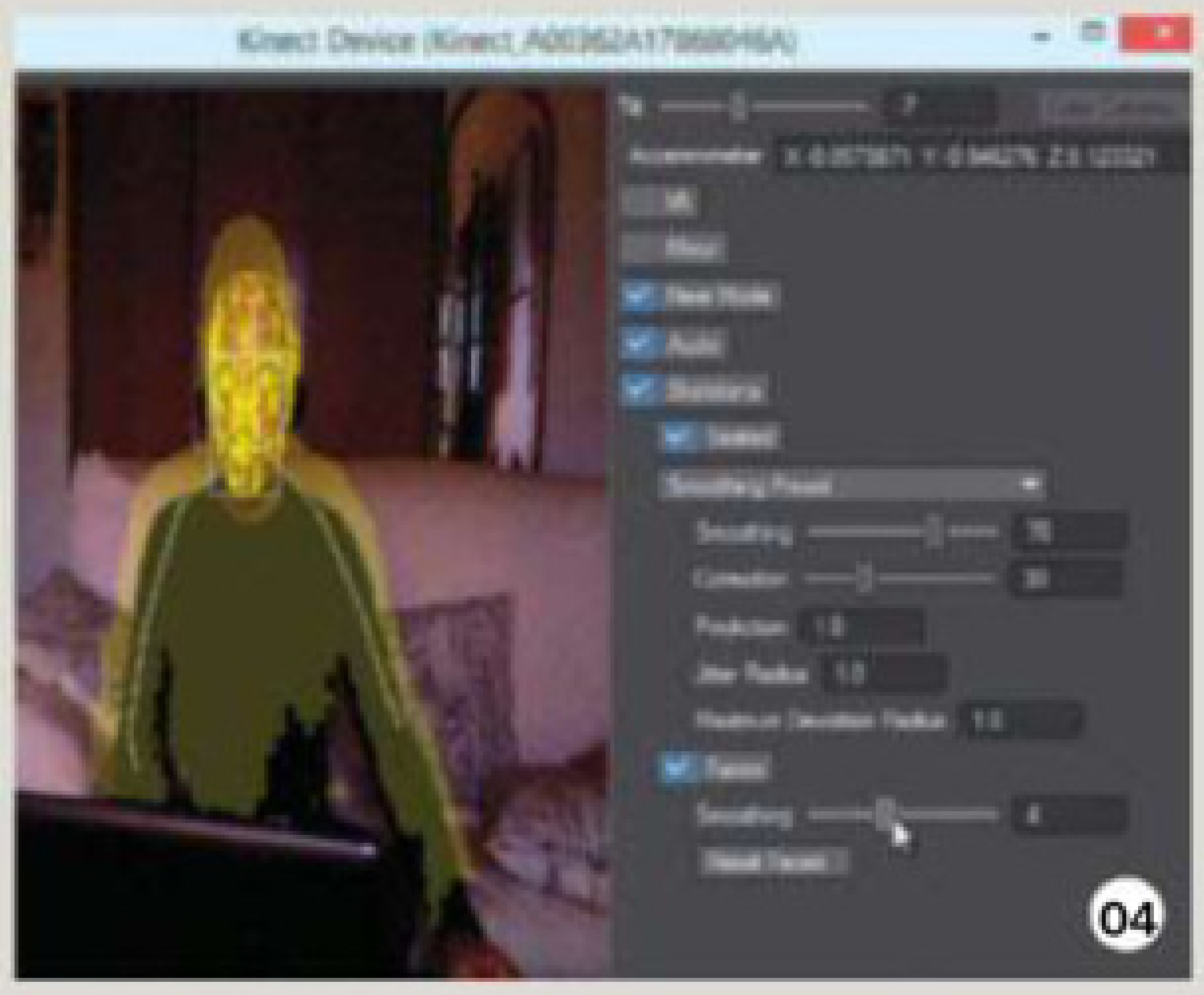
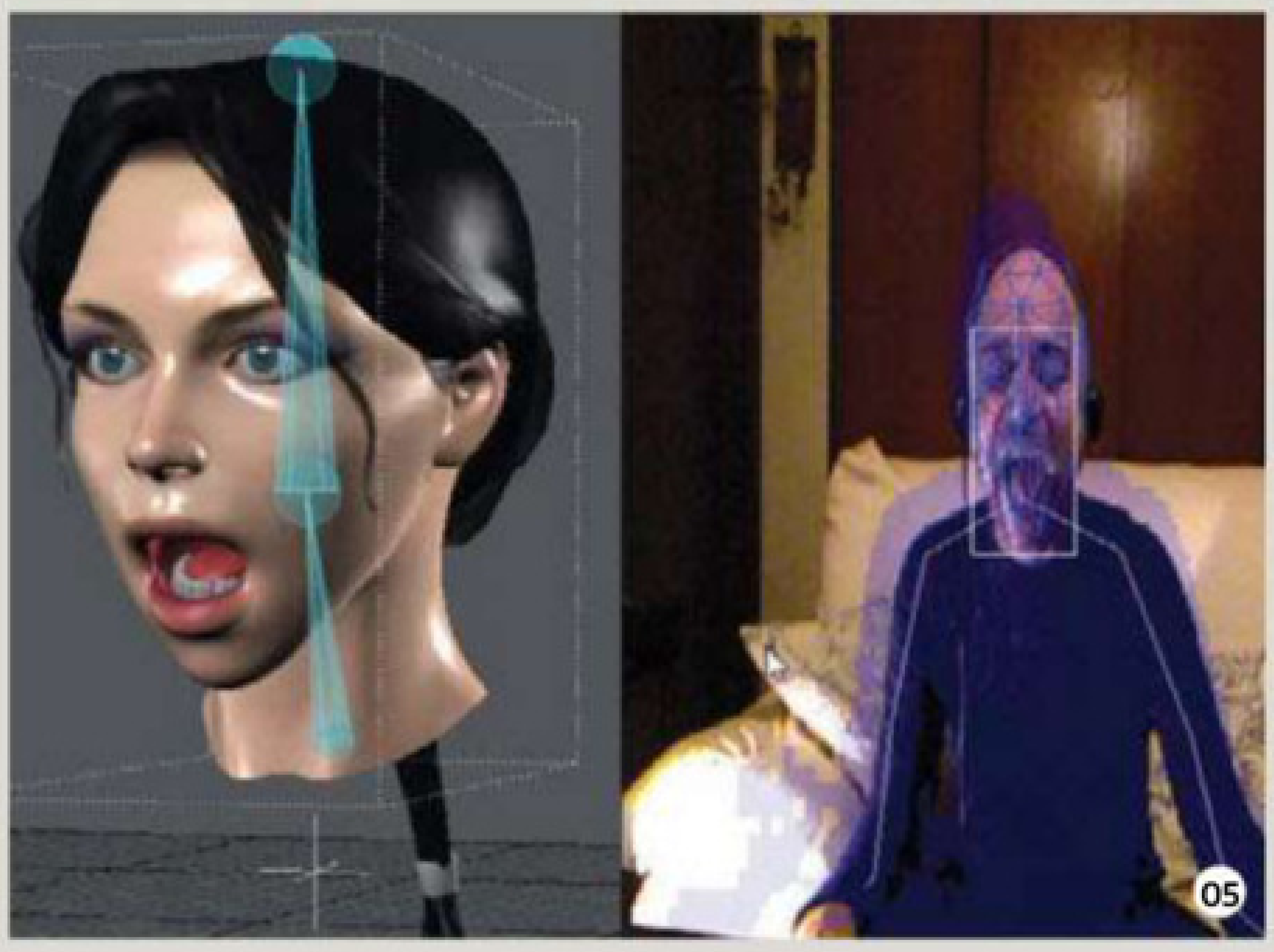










02 Control the rotation

Load LW_Woman_Kinect.LWO from the content supplied with the issue. We want to control the rotation of the woman's head using our head movement, but in order to do that we want to control the rotation of a null, and then tell the joint to follow that null's movement. Ctrl+N to add a null, then name it head_rotation. Open up the Motion Options for the null by hitting the M key and from the list of modifiers add Virtual Studio Trait. Go to the Virtual Studio menu and open up Studio, where you'll see that a new channel exists for the head_rotation. Double-click on the channel to open up the Node Editor for it, and you'll see a Trait node with the available inputs. Add a Device node and from the Manager Name menu, select Kinect for Windows. From the Device Name menu, select your Kinect. You'll now see all the outputs appear on the Device node. Find Skeleton0_Face_Pose_Rotation and connect it to the Rotation input on the Trait node. Close the panels and the null's rotation will be controlled by your head.

03 Set up the joint's rotation

Select Bone(2) and open up the Motion Options panel. Go to Controllers And Limits>Rotation, and from the Rotation Item dropdown select the null Head_Rotation. Now for the Heading, Pitch, and Bank Controllers, select Same As Item. At the moment, the orientation of the joint is different from the null. To fix this, go to the Heading Controller and under the Follow dropdown menu select B for Bank. Do the same thing under the Bank Controller except select H for Heading. Now the orientation is matched, but the rotation is inverted. You'll notice if you bank left, she goes right, and vice versa. This is an easy fix, just add a minus sign to the 'x / +' input under the Heading Controller and Bank Controller. Instead of 1.0 it will now be -1.0.

04 Smooth out the movement

Now that we're controlling the woman's head with our movement you're probably noticing that the transitions are a bit quick and jittering slightly. In the Video Display interface for the Kinect you will find a Smoothing slider. The smaller values mean a faster movement, while the higher values will be very smooth and seem to lag behind. Somewhere in the middle of around 4 or 5 is a good starting point to smooth the transitions without causing lag. There are also multiple presets to choose from in the Smoothing Preset dropdown list.

05 Control endomorphs

Select the woman's head and open up Properties. Under Deform, select Morph Mixer. You'll see all the facial endomorphs that have been created for this character. For this example we'll use the AU1 – Jaw Lowerer 1 morph. Click on the E button to open up the Graph Editor for that morph. Under Modifier, add Virtual Studio Trait and double-click to open the Studio panel. You'll see that an Endomorph channel has been created in the list, so double-click to launch the Node Editor for that channel. Add the Device node again and locate the output named Skeleton0_Face_AnimationUnit01, then connect it to the Value input of the Trait node. Now, if you open your mouth, the mesh will follow for that morph. To exaggerate it, add a Multiply node between the Node Flow and give it a value of 2. Another thing you may notice is that the woman's mouth is not closing, even if yours is. To fix this, add a Subtract node to the Flow before the Multiply node and play with the values until you get the kind of result you're looking for.

Naming conventions

While it's a good idea to stay organised with naming conventions for all the different morphs, for use with the Microsoft Kinect it's not just about organisation. You may wonder why the morphs for the woman's head begin with AU then a number. The AU stands for Animation Unit and the number refers to the list of available morphs the Kinect has for use. If you head over to **www.bit.ly/1oMJwV8**, towards the bottom of the page you will find a chart displaying a series of character facial expressions with their corresponding AU number. Use this chart when creating your morphs to find the correct output on the Device node.

• DID YOU KNOW? • All tutorial files can also be downloaded from: **www.3dartistonline.com/files**

Retopology in Maya 2015

With the Disc

Tutorial files:

- Video tutorial
- Maya scene file

INSERT THE DISC for in-depth video tutorial

ESTIMATED TIME TO COMPLETE THE TUTORIAL

3 HOURS

“How do I create a low-poly game version of my beautiful, yet extremely high-poly ZBrush model?”

In this tutorial I will teach you how to use the Quad Draw tool found in Maya 2015 to create a low-resolution mesh out of your high-resolution sculpture created in ZBrush, Mudbox or whatever sculpting program you prefer, and keep it usable in your game or film project.

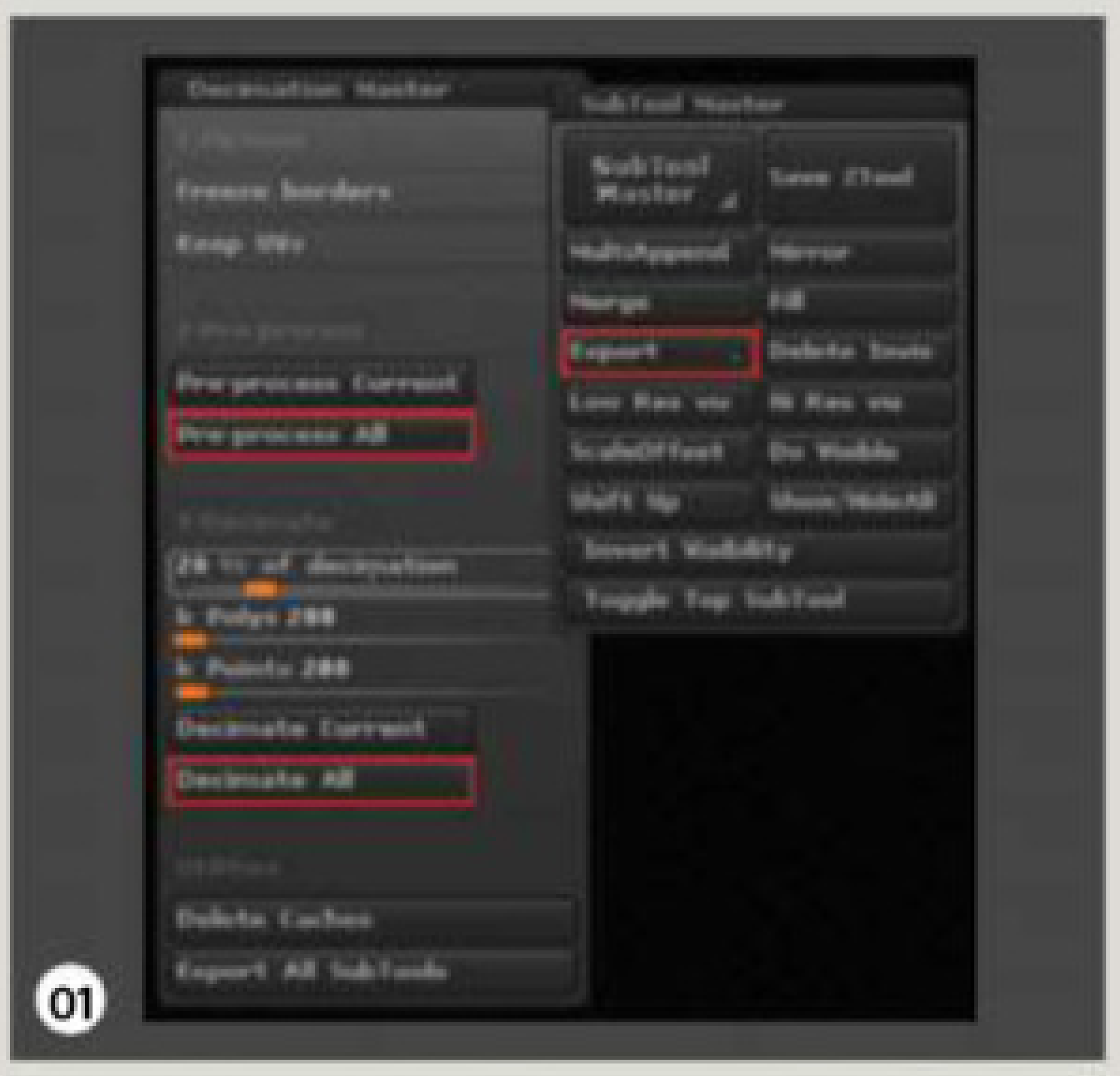
Sculpting is amazing and it is one of my favourite parts of the character-creation process. It feels great to have a super-highly detailed 3D character that has pores, wrinkles, tiny textures on cloth and every other surface. However, if it doesn't run in your game or your chosen animation software, it's basically useless.

We have to lower the resolution while keeping the right edge flow so that the mesh deforms correctly during animation. This is why you will need to have a solid understanding of what a good model looks like in wireframe. If you haven't created a low-resolution model before, it's important that you research correct mesh topology as they are used in the games or film industry.

As a teacher, I often see my students type topology into Google Images and use the first image that pops up as their reference. This is lazy and it's bad practice. There are too many bad examples out there. If you're looking for reference, go after the stuff that is created by professionals.

This part of the character-creation pipeline is called retopology and it is extremely important to get it right. In many cases this will be the final mesh that you will use for the rest of the character's life.

Something to remember when creating topology is that when modelling a real-time mesh, it's absolutely fine to have tris, but remember that every edge has to be there for a reason. Proper edge loops are crucial and should always adhere to the high-resolution model's silhouette.



If this is your first attempt, realise that you will make mistakes. If you do, don't stress. Making mistakes is all a part of the learning process and they have to be made so we can learn from them. If there is a part of the mesh that isn't working properly, just delete that section and start again – it's a lot easier than trying to fix bad edge flow! Like sculpting, regular practice and repetition goes a long way.

The character featured in this tutorial is fan art based on a character from Carbine Studio's new game, *Wild Star*.

01 Export from ZBrush

Once you have your high-resolution mesh completed in ZBrush, it's time to reduce its polycount before exporting to Maya, as on most machines a 10-million tri mesh will not successfully run.

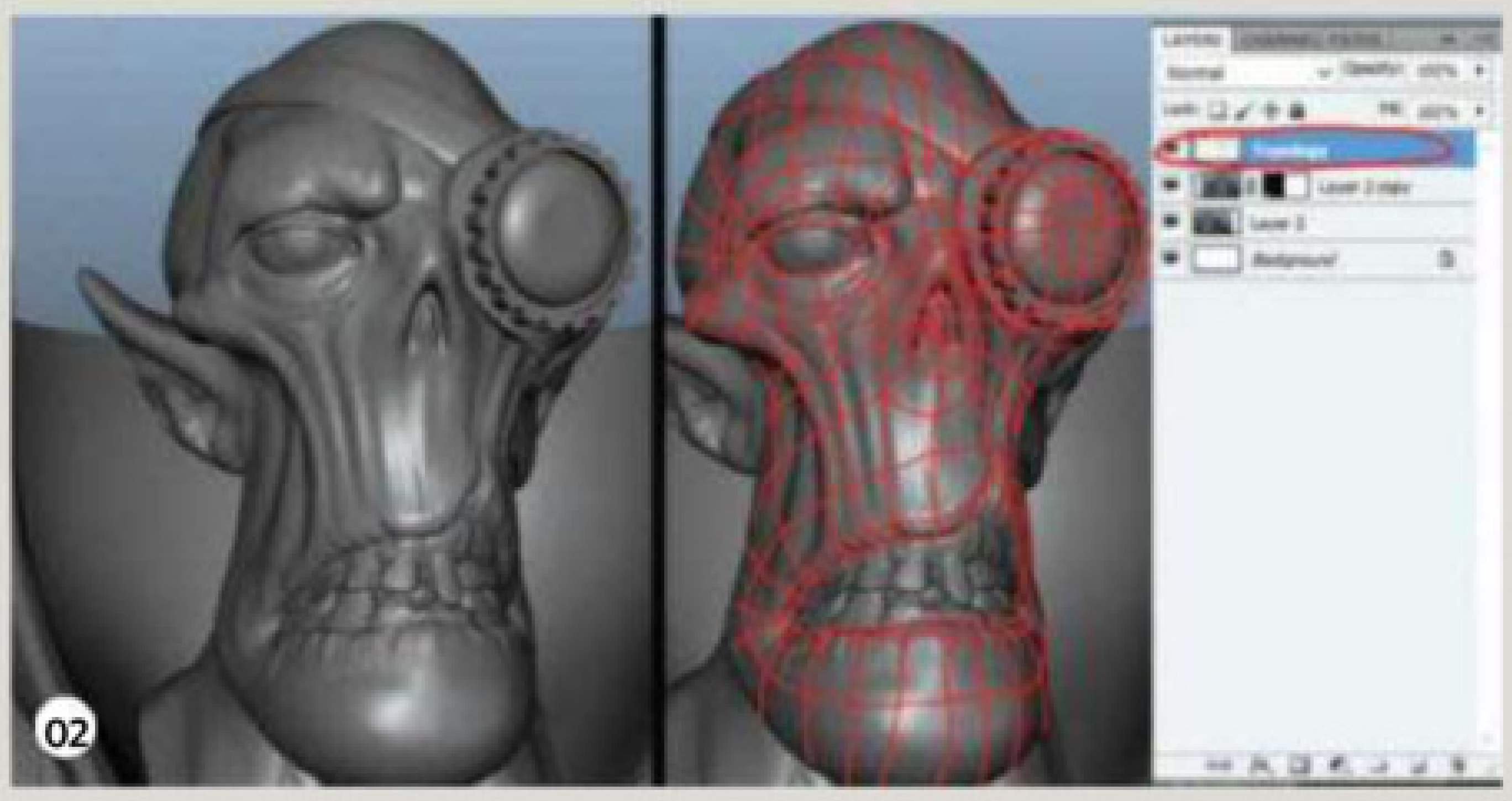
Merge SubTools that you want to keep grouped together in Export, as this will make the retopology process much easier. Go to Zplugs>Decimation Master>Pre-process All. Once the pre-processing is done, go to Zplugs>Decimation Master>Decimate All. Your model is now at 20 per cent of the original polycount. Now export your model from ZBrush and import to Maya and put each grouped high-poly piece on its own separate display layer.

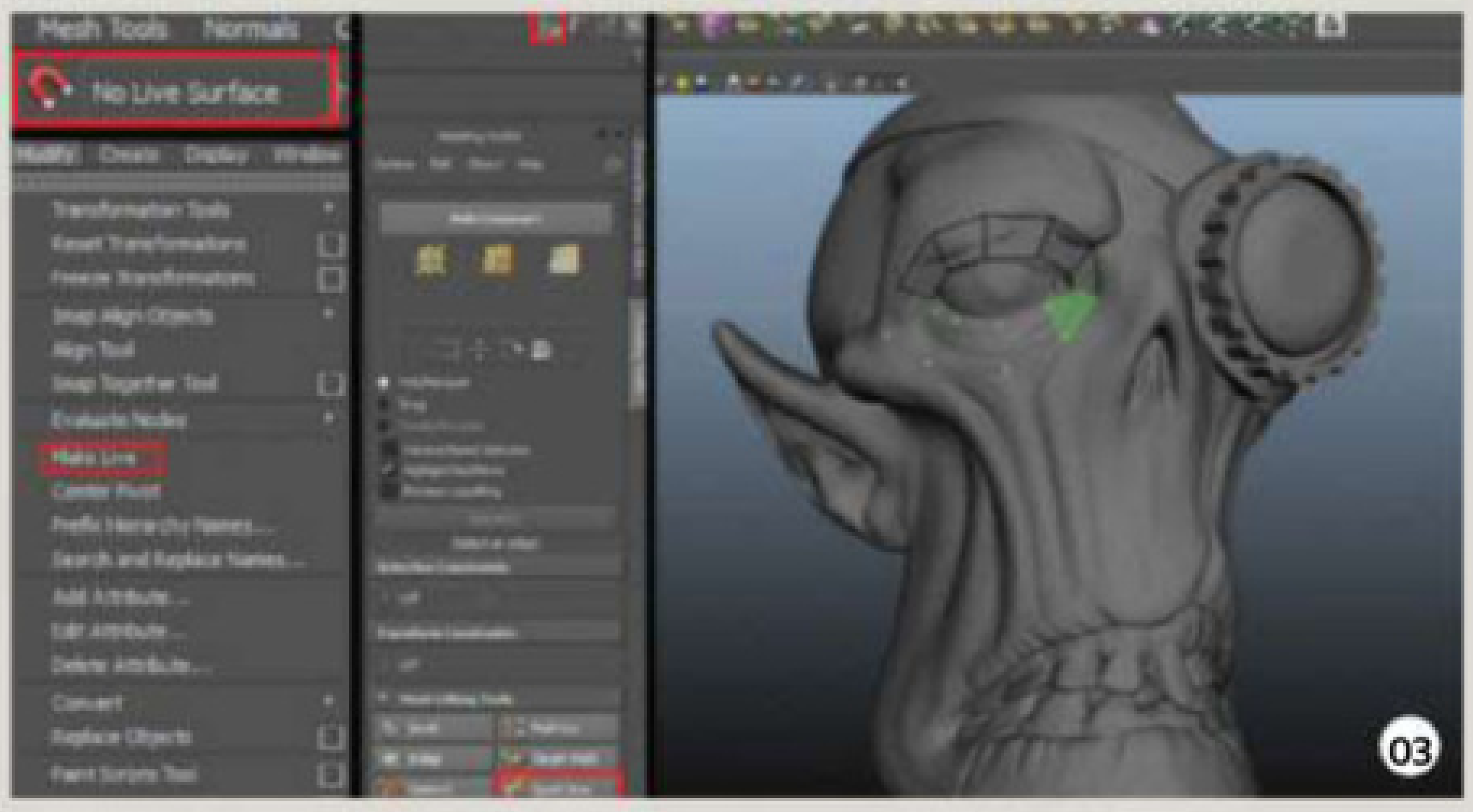
02 Plan and use reference

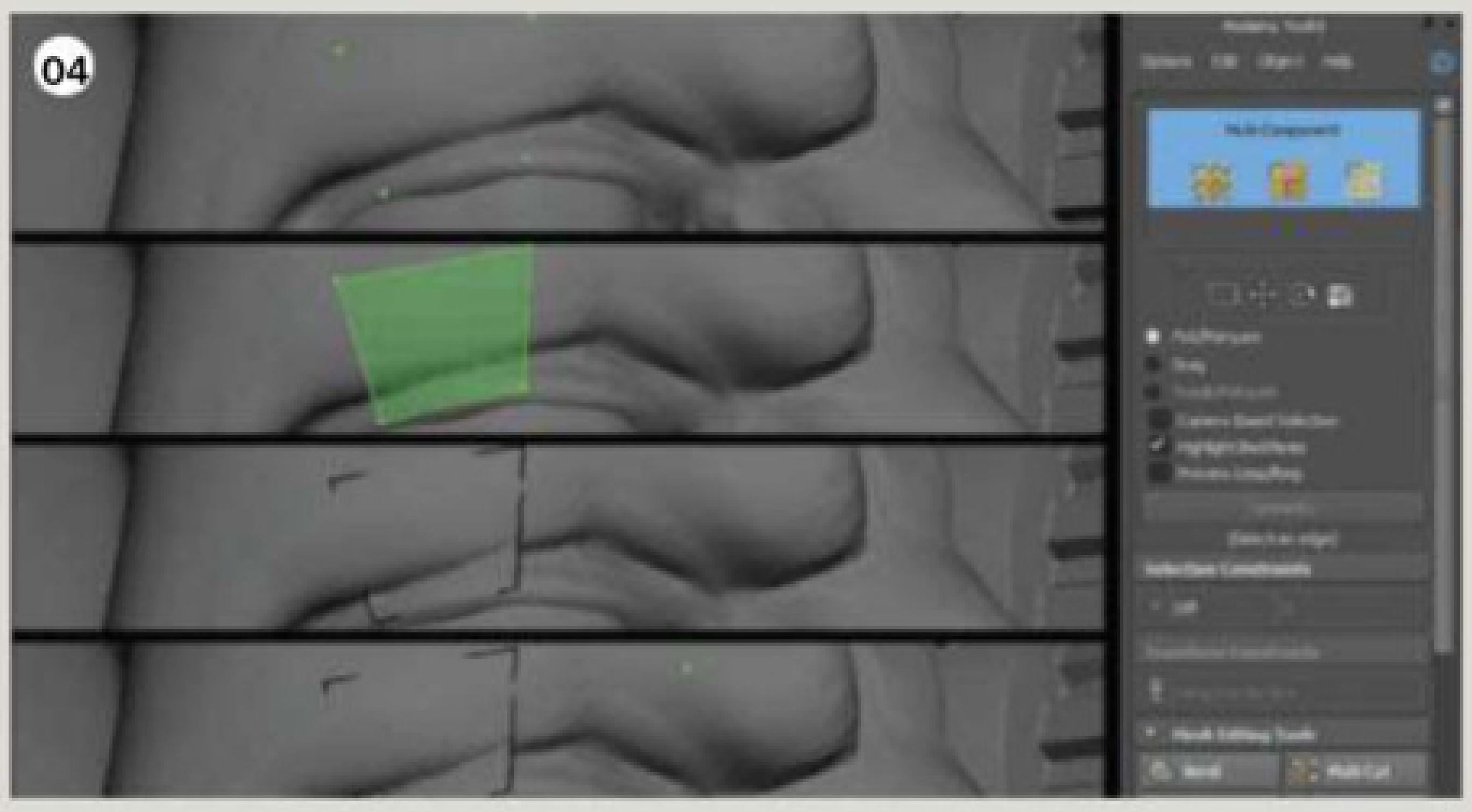
Before you attempt retopology on your model, make sure you gather reference. A good place to start is the **3D Artist** gallery, or Polycount's wiki page. There is a section devoted to topology if you follow the links in the Character section. Make sure you have a whole bunch of reference for the different parts of the character and from different angles. Another good idea is to get a screenshot of your sculpt and draw over it in Photoshop, trying to make a plan for your retopology before you even open Maya.

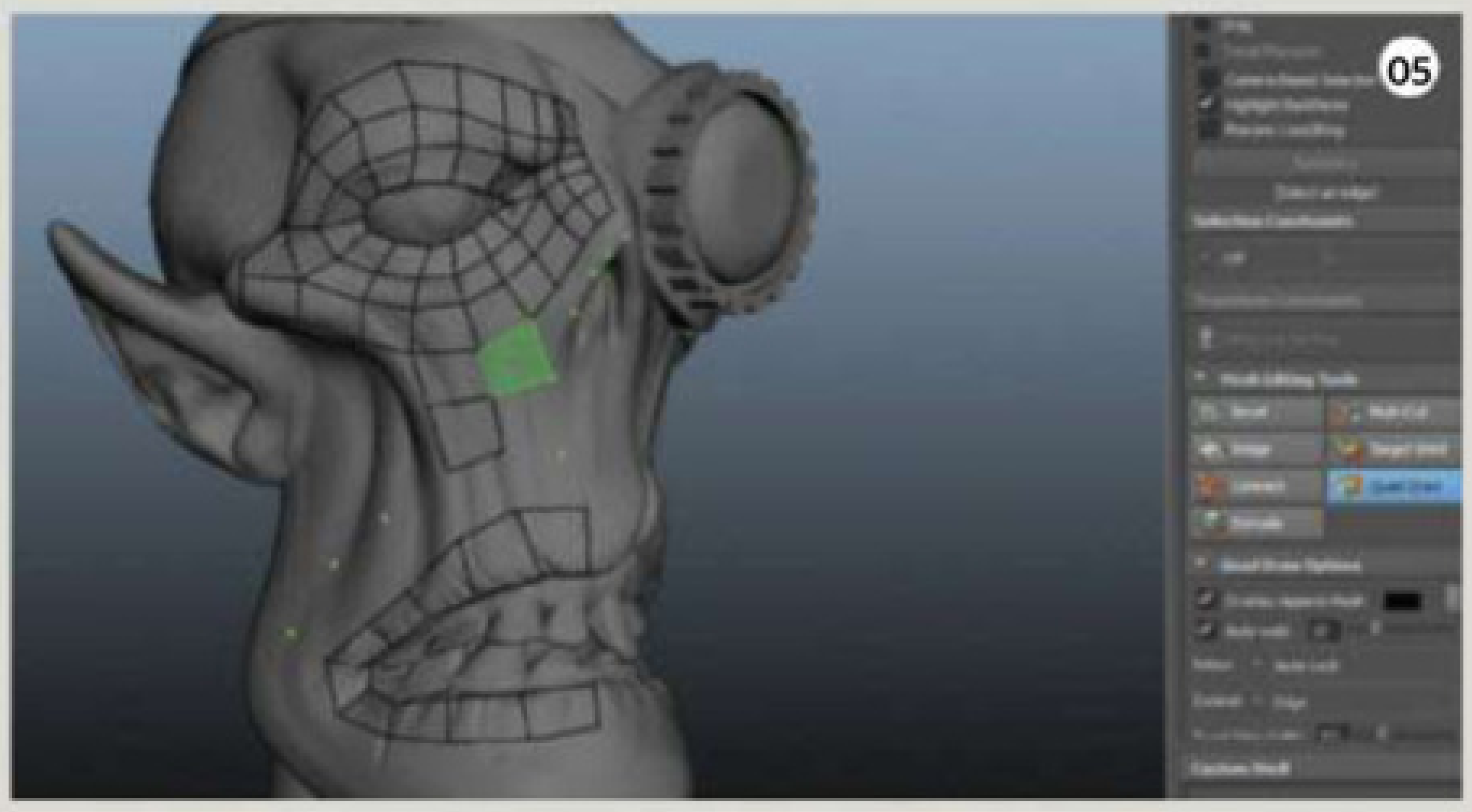
03 Make live and start to quad draw

It's time to retopologise! Make sure your high-poly model is on its own display layer. This is so that you can hide parts that you aren't working on at any particular time. Select your high-res model and make it live by using the magnet symbol at the top of your screen, or go to Modify>Make Live. This enables you to create polys on top of your sculpt. The verts will also stick to the mesh, which will help you to keep the same silhouette. The tool you will be using is the Quad Draw tool.









04 Retopology time

Activate the Quad Draw tool. As long as you have made your high-poly model live, you will be able to add points to the surface and turn them into polygons. If you click on the surface, a green dot will appear. You can move them around by using middle-click. Create four points, hold Shift and hover your mouse cursor in-between the four points, then click. This is your first poly! Now you can create two green dots near an existing edge. Quad Draw will recognise the existing verts and you can create another polygon.

05 Learn the shortcuts

Learn the keyboard shortcuts for Quad Draw, as if you don't, you will be severely limited in what you can do. Here is a list.

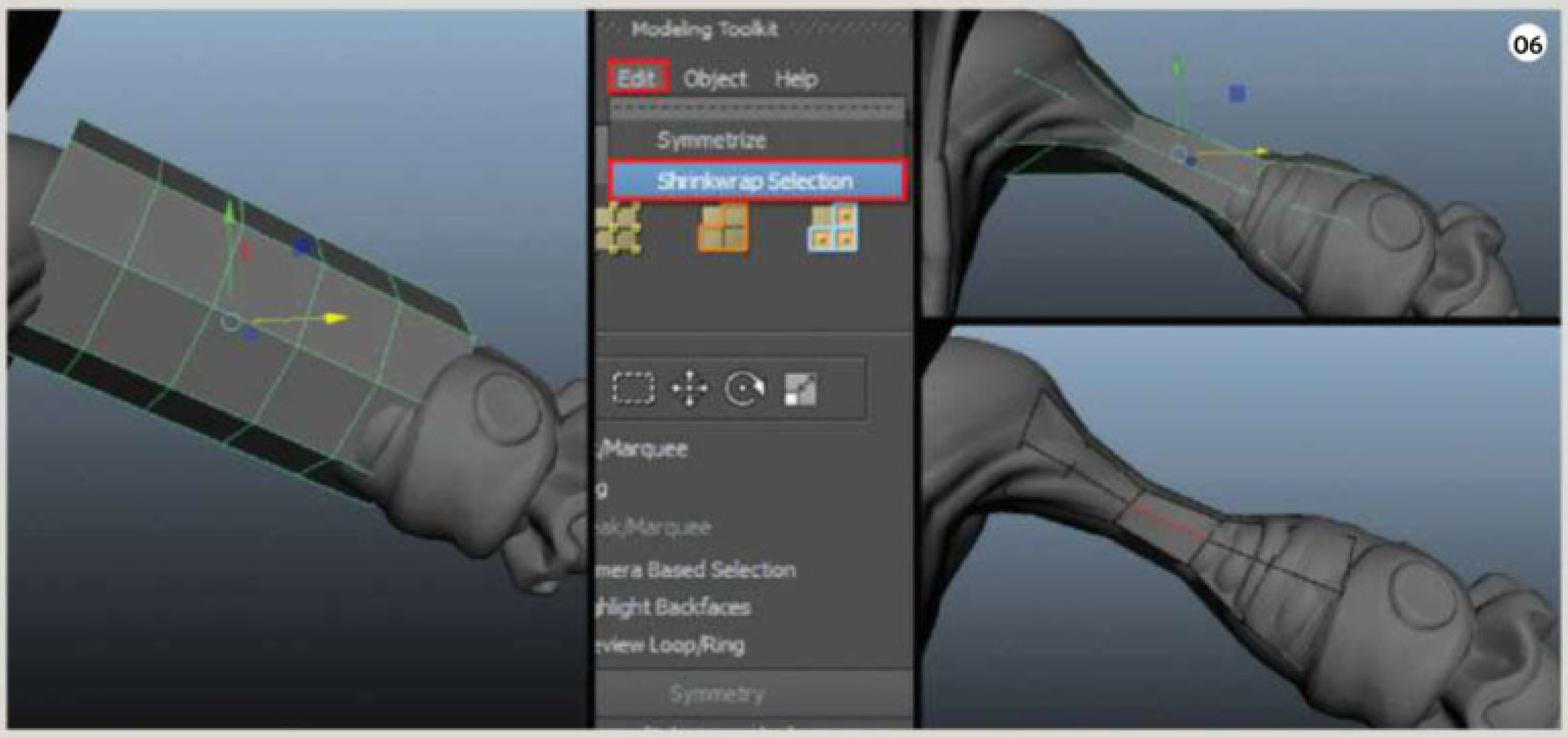
Drag or MMB+drag = Tweak components
Shift +drag = Relax vertices
Shift+MMB+drag = Relax a certain selection of vertices
Cmd/Ctrl-click = Insert edge loop
Cmd/Ctrl+MMB click = Insert edge loop and snap to centre
Cmd/Ctrl+Shift-click = Delete components
Cmd/Ctrl+Shift+MMB drag = Move a specific edge loop
Tab+drag = Extrude edge
Tab+MMB drag = Extrude edge loop

06 Use Shrinkwrap to finish

While retopologising you will find that doing large surfaces and cylindrical objects like the arms, torso and fingers gets very tedious. A tool for simplifying these is Shrinkwrap. In this example I have retopologised the left arm. I created a cylinder that was eight-divisions round, five-divisions high and zero-divisions on cap, which I then deleted. I positioned the cylinder roughly over the arm, then went to Edit>Shrinkwrap. This snaps all of the cylinder's vertices to the high-poly model. Then it's a matter of selecting Quad Draw and relaxing or tweaking, and continuing with retopology.

Put on some music and get repetitive

Now that you know how to use the Quad Draw tool, it's time to put on some good music and just get it done. If you take forever on one single step, it will never be complete. However, repetition is key when it comes to learning something new. If this is your first time then I would advise practicing on the smaller parts of the model and posting to a community forum to get feedback. Topology is a really big deal, and if you don't manage to get it right then it can make life harder for every step from here on out.



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Model curtains with splines

With the Disc

Tutorial files:
- Tutorial screenshots

ESTIMATED TIME TO COMPLETE THE TUTORIAL

30 MINS

INSERT THE DISC for in-depth video tutorial

“How can I create realistic curtains using splines in 3ds Max?”

Creating a realistic interior scene for architectural visualisations requires a number of factors that need to blend well together. Having well-modelled objects, accurate materials and a natural light behaviour are mandatory to achieve a good result. However, even in a brilliantly rendered scene there are some objects, such as curtains, sheets, blankets and other kinds of fabric, which can suggest to the viewer that something's off. These things could ruin the realistic feel of your render.

To avoid that, one of the things to bear in mind is to have a good set of references. The internet is a powerful tool in this aspect, so before considering the modelling process of a curtain you should research different types of curtains, thinking about how they hang and how they look in various scenes. Most of the time our memories of an object alone aren't reliable enough to serve as a base for creating good models.

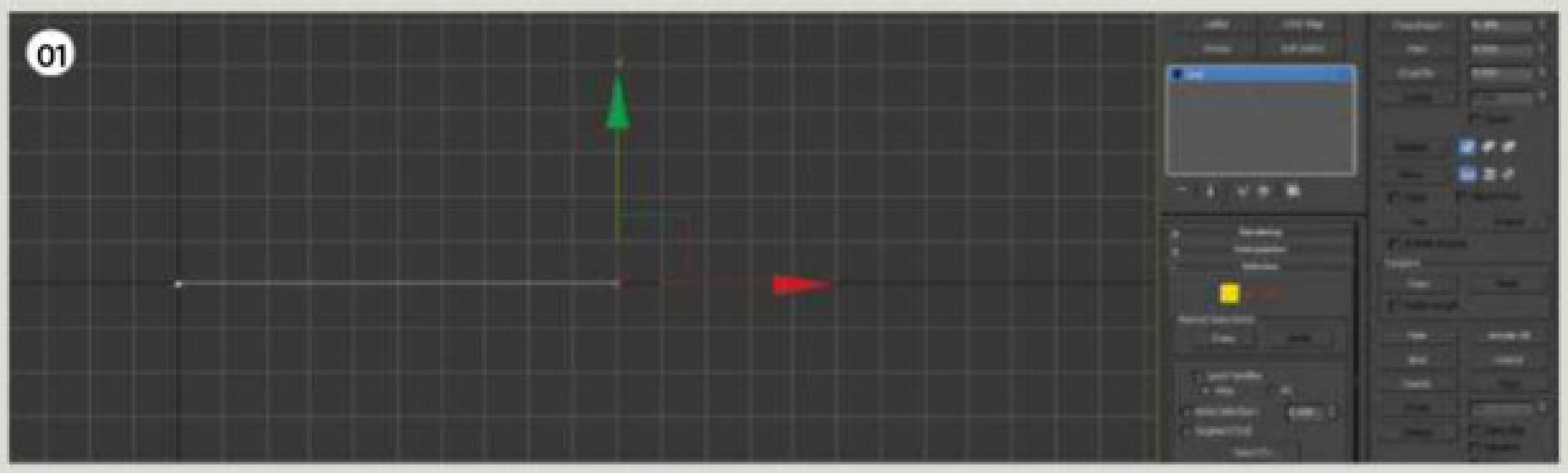
Your references might often appear quite complex, but remember there are always many ways of achieving the same result – when modelling curtains, starting with a simple, straight spline is an easy and very practical method, especially when they're not the main focus point, or are just a secondary and supporting prop.

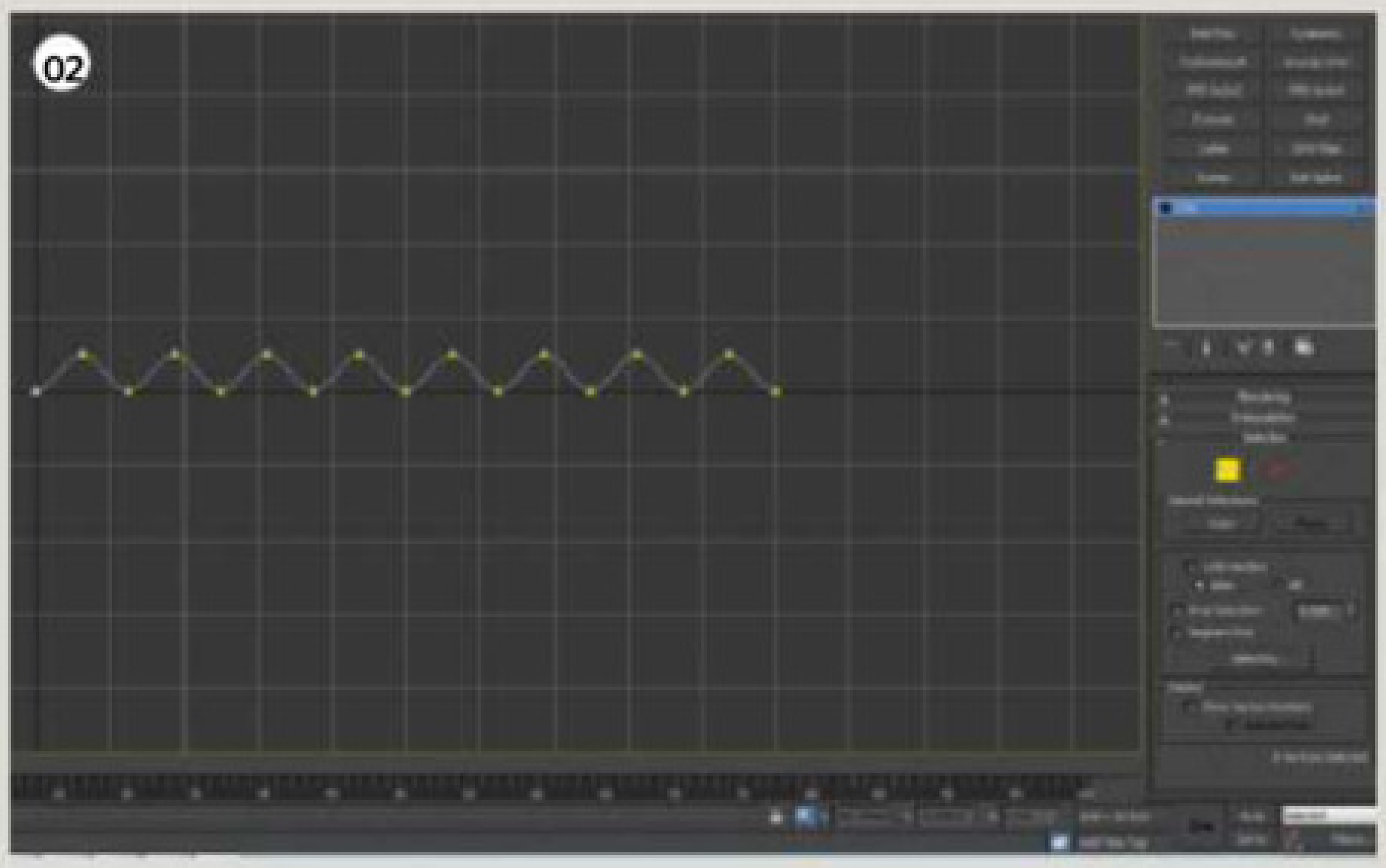
Throughout this tutorial we'll reveal how splines can be used to create a standard curtain that will blend in well in any interior scene. Throughout the six steps we'll be focusing on how to start a curtain with a simple spline and, when it gets to the point, to convert it to an editable poly in order to tweak it and modify it to get a more realistic shape. We'll also cover how to create a good shader that offers enough transparency to give the curtains some life, with light coming through the window positioned behind it.

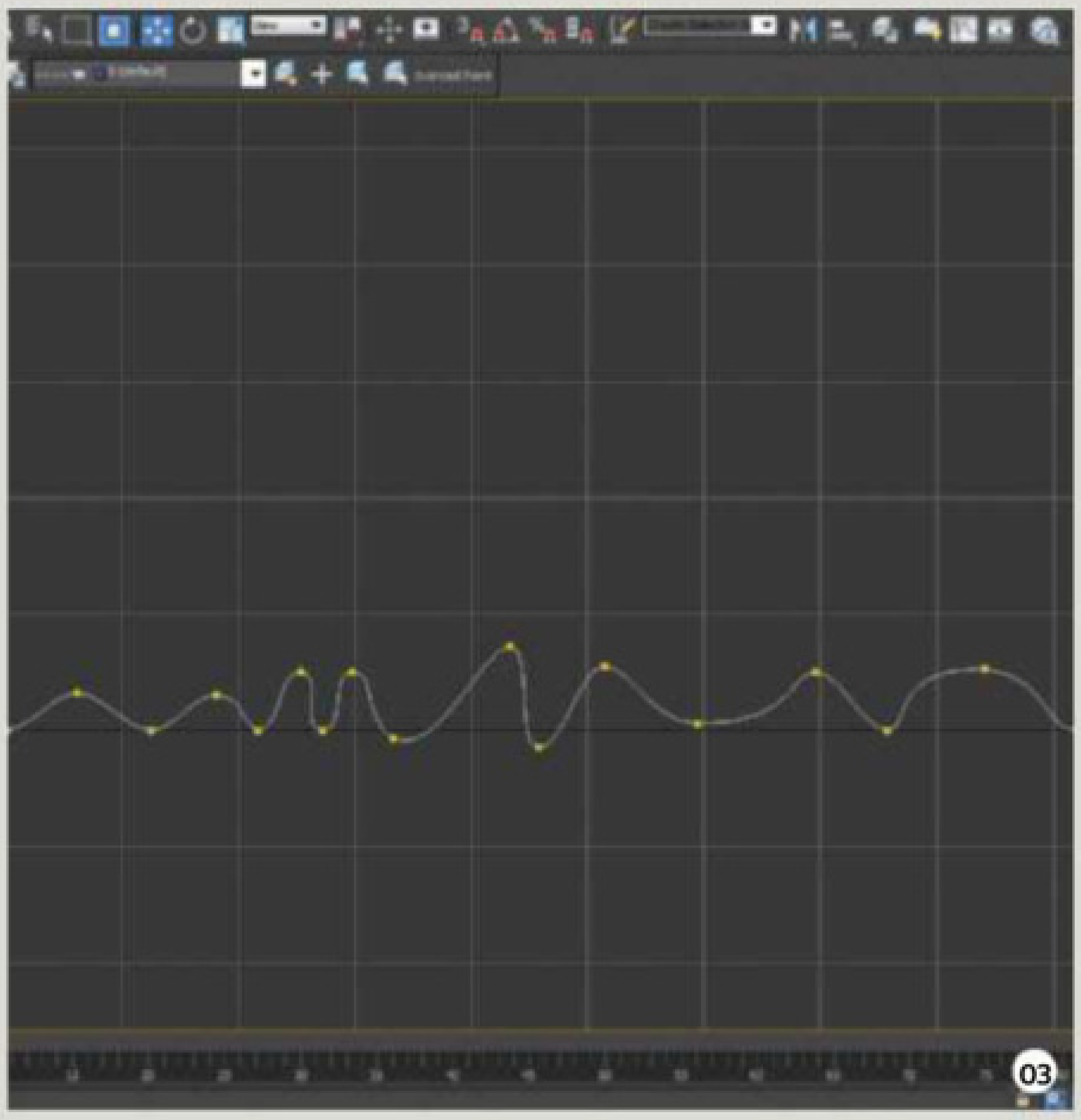
Remember that as a tool, splines are a powerful resource that offer a lot of possibility when it comes to building many various objects such as glasses, bottles or jars. There are many various uses for splines in arch-vis. As usual, the more we experiment with a specific tool and explore its features, the more we realise how vast its potential is and in which situations that tool could be the perfect solution. Always experiment!

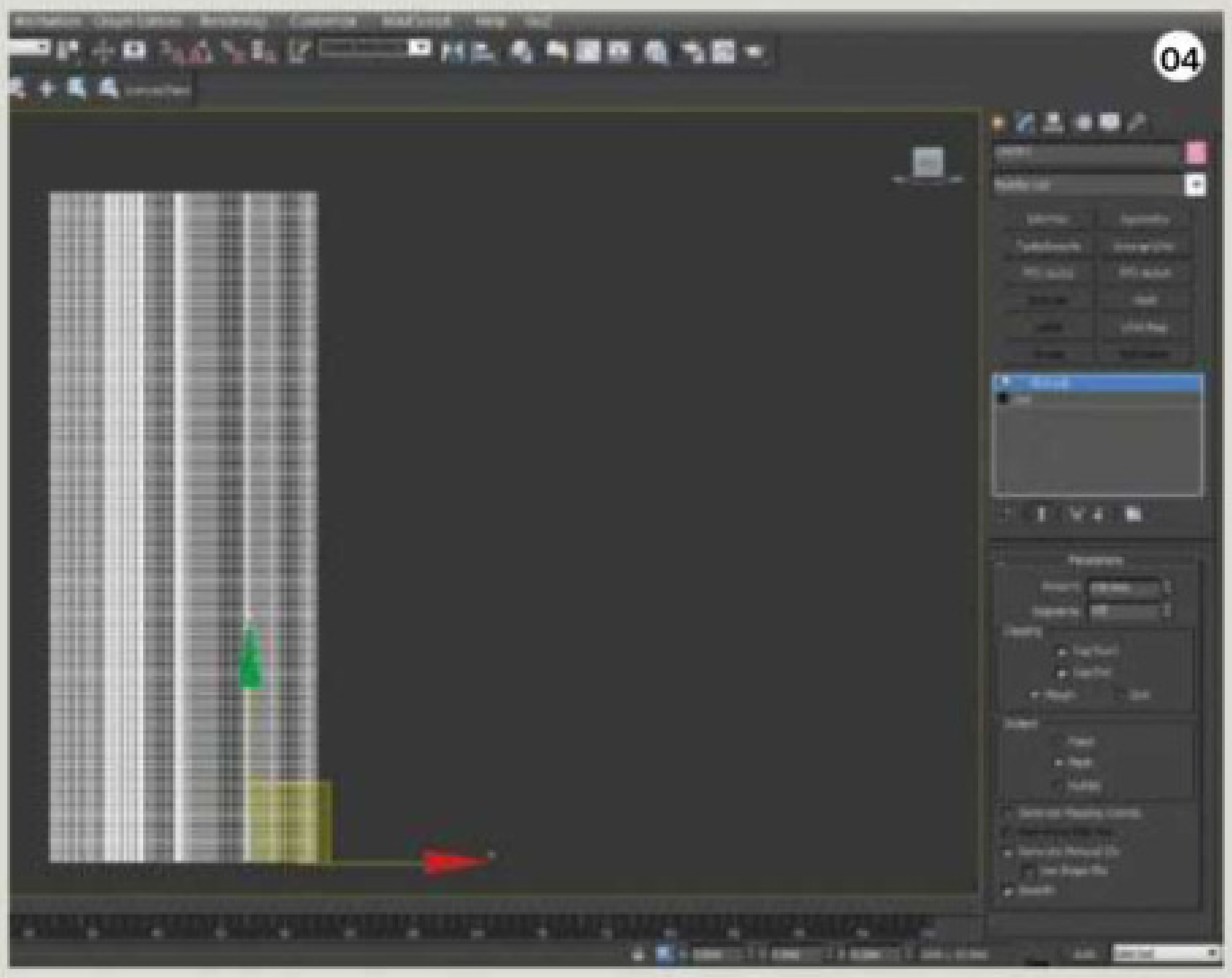
01 Create the spline

Go to Create Menu>Shapes and click on Line. Next go to Viewport, select Top View and click with your mouse. Press and hold Shift, move your cursor right and once again click the mouse. Now, Ctrl/right-click it to finish creating the spline. Be aware of the size of the spline as it will directly affect the width of the curtain. For this tutorial we're creating a curtain with 100cm width, so when creating the second Vertex, look on the information on the X Data on the box located on the bottom of the viewport.









Control the pattern

UVW Map is a great tool to control patterns on simple objects, such as this curtain, without the process of unwrapping the UVW map. If you have a square and a seamless image you only need to insert it on the Diffuse slot on the material that you're using. Inside the Slate Material Editor, turn on the Show Shaded Material in Viewport to see the map directly applied on the object. Now that you can see the image and how it's going to be rendered, it should be much easier to control it and modify it in the way that you want.

02 Edit the Spline

While still on the Top View of the Viewport, select the Spline and go to the Modify menu. In the Selection tab, click on Segment and choose the only Segment available. In the Geometry tab, scroll down until you find the Divide option, write 15 in the box and press the Divide button. The Spline should have now 17 vertices. In the Selection tab, choose Vertex and then press Cmd/Ctrl+A to select all vertices. Now Ctrl/right-click on the Viewport and choose Bezier Corner. Now choose every other vertex and move them around 5cm in the Y axis to get a snaking effect.

03 Shape the curtain

Now that the base of the curtain is done, it's time to start tweaking some of its folds into a more realistic shape. Select Vertex and chose the second Vertex of the Spline. Move it right and down (either with Edit>Move or by pressing the W on your keyboard). Try to recreate natural behaviour. You can also use the Bezier Corner on both handles to change and modify its curve in order to create different folds. Go over the other Vertices and change each of them according to your reference images of the real curtains.

04 Elevate the curtain

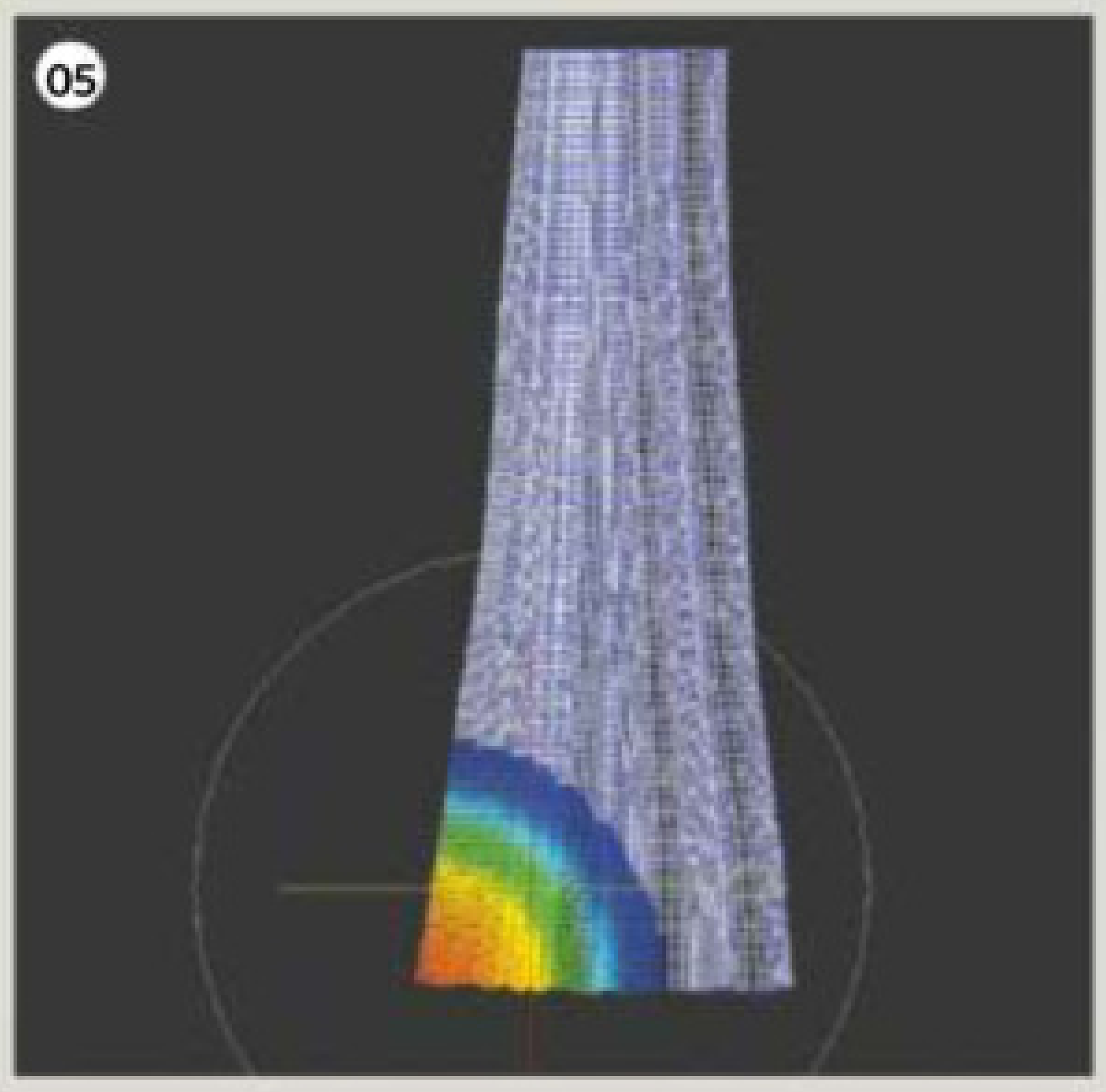
Now unselect the Vertex and, with the Spline still selected, go to the Modify menu, and select and apply the Extrude modifier. On the Extrude options, go to the Parameters tab and set the Amount to 230 cm (depending on the height of your scene) and 100 Segments. The number of Segments will affect directly the flexibility of the curtain when modifying its shape on the following steps (the higher the Segments, the more elasticity that the curtain will have). Switch to the Front View (F) to see the curtain.

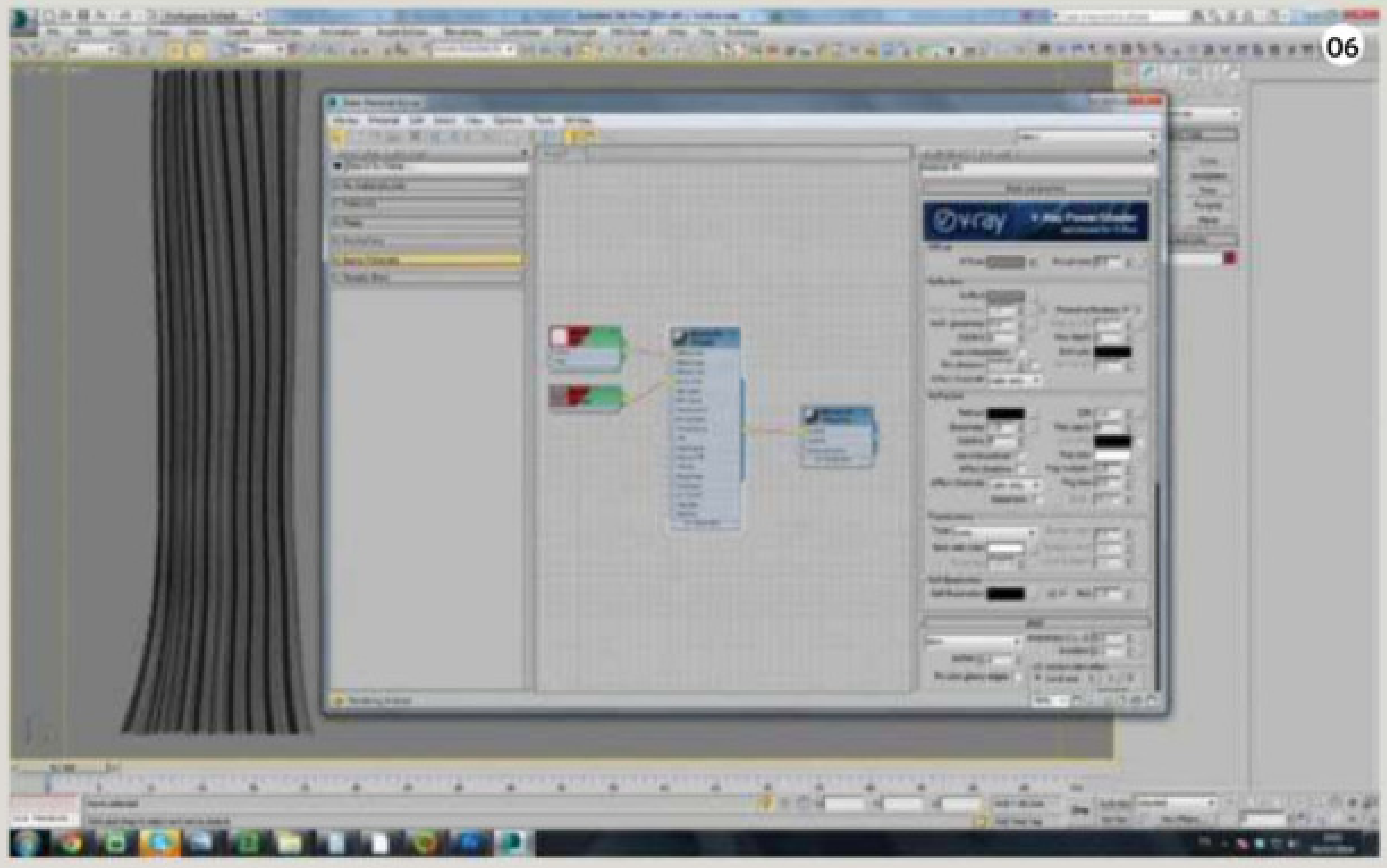
05 Detail the curtain

Select the curtain and in the Modify menu choose FFD 4x4x4 modifier and apply it. In the Parameters tab, select the Control Points and, from top to bottom, start narrowing the curtain and tweak it as you have seen on your references. Now apply an Edit Poly modifier, choose Vertex and turn on Soft Selection in the Soft Selection tab. Set the Falloff to 60 cm and select one Vertex on the curtain to move and rotate it to create a realistic shape. Repeat this procedure until you're happy with the result.

06 Apply a material and your desired pattern

Press M to open the Slate Material Editor and create a Vray2SideMtl. Click on Front Material and create a VrayMtl. For that Front Material you can insert any pattern on the Diffuse slot, or you can create one with a Standard map such as Tiles. Click on the Reflection Color and write 129 for RGB, insert 0.6 on Reflection Glossiness and turn on Fresnel reflections. To control the pattern, select the curtain, go to the Modify menu and chose UVW MAP. In the Parameters tab, select Box and write 50cm on Length, Width and Height for square patterns. By selecting Gizmo you can move, scale or rotate the pattern however you like.





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The Viewport and ActiveShade systems have both been improved, so making lighting and rendering decisions is now easier than ever

3ds Max 2015

With Maya 2015 reviewed in the last issue, we now put the latest iteration 3ds Max 2015 under the microscope to see whether it's really worth the upgrade

REVIEW BY Dave Scotland, VFX artist, animator and lecturer at AIE, Australia

After recently reviewing Maya 2015 and having such a positive experience, I was excited to see if the new release of 3ds Max matched the wow factor. I regret to inform you that, relative to Maya's new feature set, 3ds Max 2015 is quite underwhelming.

Don't get me wrong; it's a solid release with some great improvements, and to new 3ds Max users, you'll certainly enjoy using the application. With the exception of Point Cloud support and ShaderFX, however, existing users might well ask what the point in upgrading is. To help answer this question, I created some simple scenes to test both the new features and the many improvements.

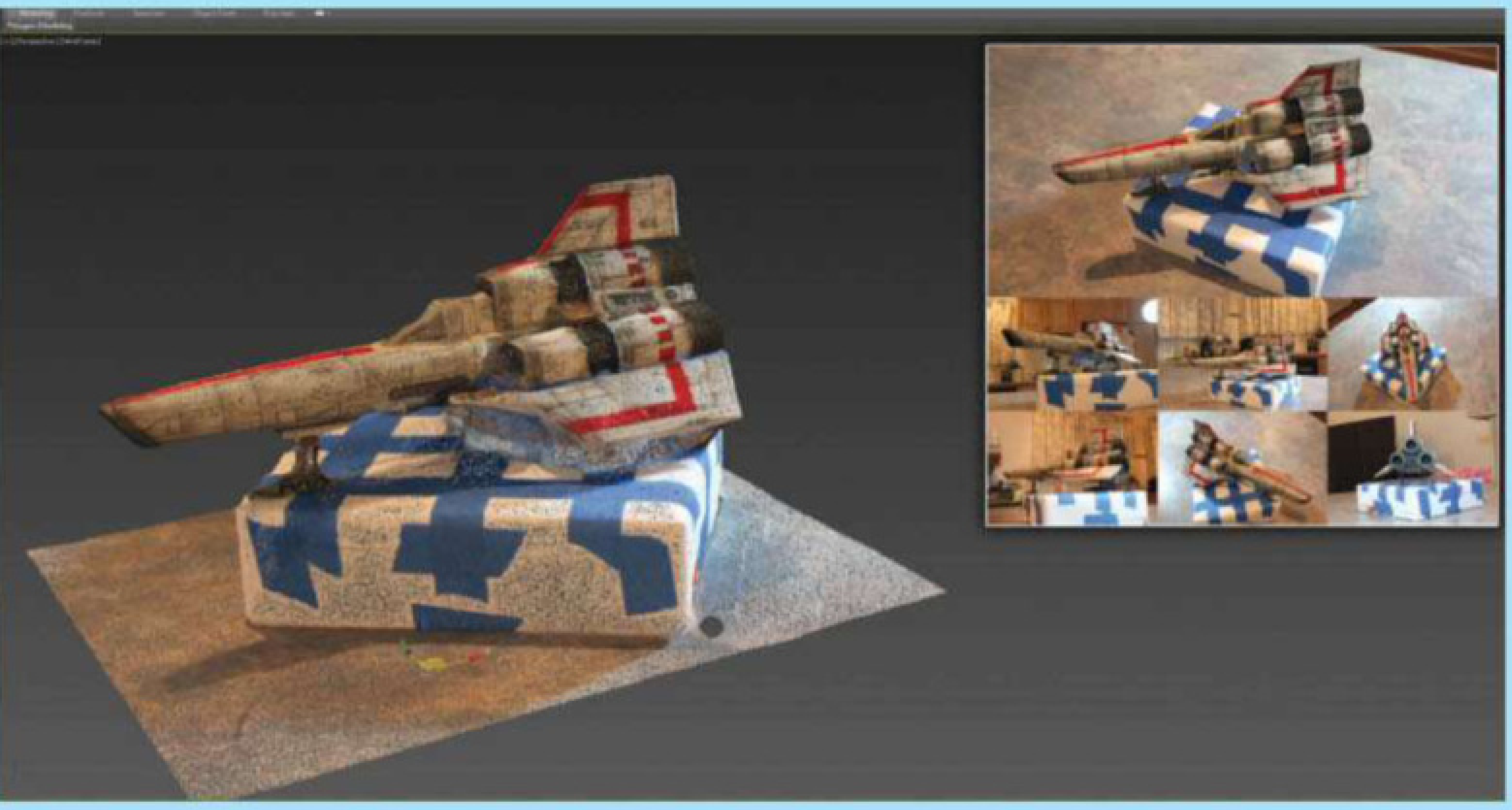
I started with the new Point Cloud feature, something I've been quite excited about. It certainly didn't disappoint. Previously available to 3ds Max 2014 subscribers, Point Cloud support opens up a whole new range of possibilities, especially when used with the free Autodesk Recap360 online service. By using photogrammetry, Recap360 enables you to upload a series of photographs, which can then be used to create a Point Cloud or 3D geometry. This dataset can then be imported into 3ds Max, using the new Point Cloud Object.

With regards to modelling, I found the new Placement tool a fantastic addition. If you have spent any time creating environments or complex objects with many separate parts, this tool will massively increase your efficiency. Being able to move objects around the scene interactively, relative to the existing geometry, allows for a more creative experience. You can try out variations which, in the past, might have been too time consuming to try out.

Another welcome addition is the new ShaderFX, a real-time shader editor. I was able to get some great results quite quickly. There is a slight learning curve – particularly if you're not familiar with a node-based material process – but the flexibility it gives you is well worth it. I found the real-time viewport feedback was great and the ability for TDs to go deeper into the settings should provide a whole new bag of options.

After years of debate within the CG community, it feels like we finally have a unified scripting solution and it comes in the form of Python. Maya, NUKE, Houdini, MODO, Motion Builder, CINEMA 4D, Blender and now 3ds Max all share this common scripting solution. However, if you're a MaxScript nerd like me, you'll be happy to know the Max Python API provides a great bridge between MaxScript and Python and it even lets you evaluate MaxScript code.

There has also been a major rethink of the scene management tools. You might be



The new Point Cloud features bring new possibilities to the modelling pipeline, including texture support

Essential info

Price: £3,200 / $3,675 US

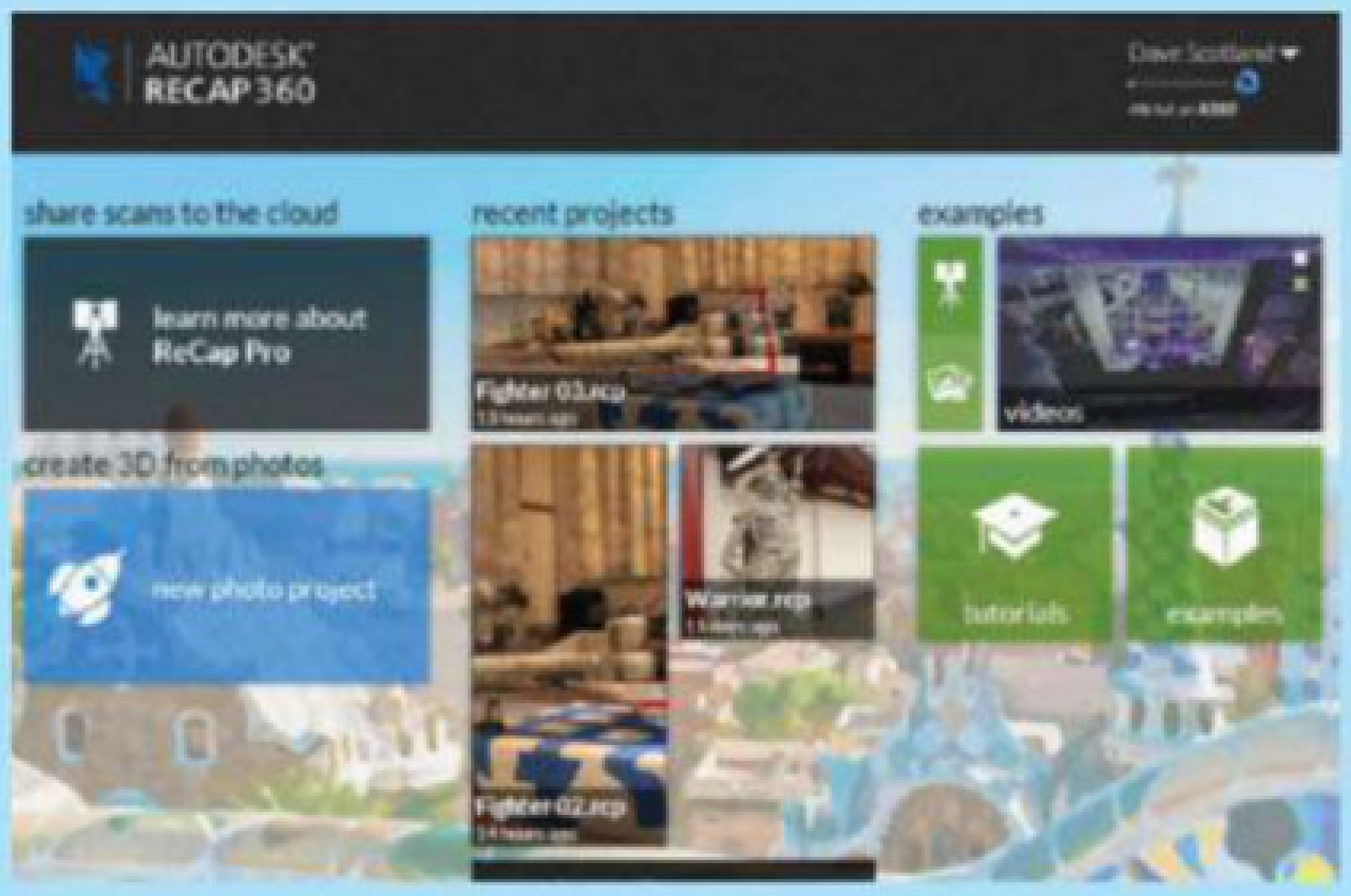
www.autodesk.com/products/3ds-max

OPERATING SYSTEMS

- Microsoft Windows 7 (SP1), Windows 8 & Windows 8.1 Pro

OPTIMAL SYSTEM REQUIREMENTS

- 64-bit Intel or AMD multi-core processor
- 4 GB of RAM (8GB recommended)
- 4.5GB of free disk space for install

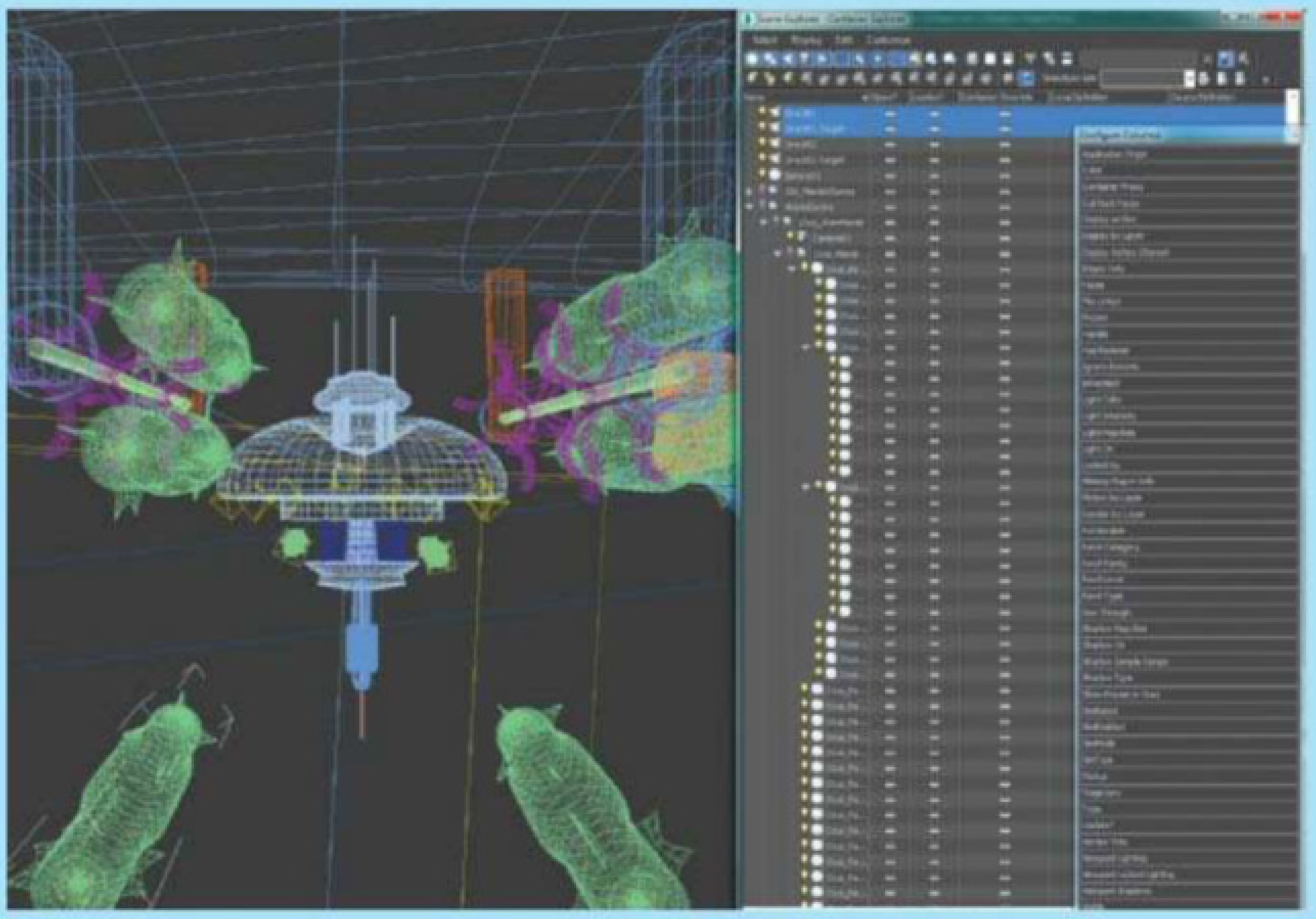


Upload a series of photographs to Autodesk's Recap360 free online service to create a Point Cloud or geometry

The good & the bad

- ✓ Point Cloud support
- ✓ Python support
- ✓ ShaderFX with real-time feedback
- ✓ Placement tool
- ✓ Viewport and ActiveShade improvements

- ✗ Light development from Autodesk
- ✗ Stereo camera support – not installed as standard
- ✗ Not enough community feedback addressed
- ✗ No Bifrost support



The customisable Scene Explorer has been redesigned to include many of the layer management tools

familiar with using Manage Layers and Scene Explorer to select, sort and manage assets within a scene. These tools have now been combined together into the singular Scene Explorer. Having used both for so long, it did take some time to adapt, but this is certainly a major improvement.

The rest of my review time was spent testing various scenes between 3ds Max 2014 and 3ds Max 2015. I wanted to see if the improvements under the hood really stacked up. I found that the general viewport performance had improved in both efficiency and accuracy, and ActiveShade rendering also felt much more responsive. It's not quite up to Maya's Viewport 2.0 standard, but it's still quite valuable.

3ds Max 2015 certainly has plenty of improvements, a few new features and various well thought-out redesigns, but is it really worth the upgrade? Well, based on the more refined responsiveness and workflow improvements alone, I believe the answer is yes. While there aren't tons of updates, if you compare versions of 3ds Max you certainly won't be disappointed.

The addition of Python scripting support for 3ds Max opens up huge potential for both production efficiency and creativity

Our verdict

Features	**7**/10
Ease of use	**8**/10
Quality of results	**9**/10
Value for money	**8**/10

> A few new features and some good improvements, but development feels a bit limited

Final Score 8/10

This is a model for *Orbitor* that was textured in Mudbox 2015 and rendered in Marmoset Toolbag

Mudbox 2015

Mudbox 2015 is here and it's time to take it for a spin. The new features revolve mostly around retopology, texturing and transferring between Mudbox and Maya 2015

REVIEW BY Adam Ball, lead artist, Evil Aliens, Australia

According to Autodesk's website, the new features to Mudbox 2015 include tools for symmetrical retopologising, efficient layer grouping, Maya interoperability for textures, image plane matching, and Maya Blend Shape interoperability. This is alongside texture paths, export and updating, the Caliper tool and support for Intel HD graphics 4000.

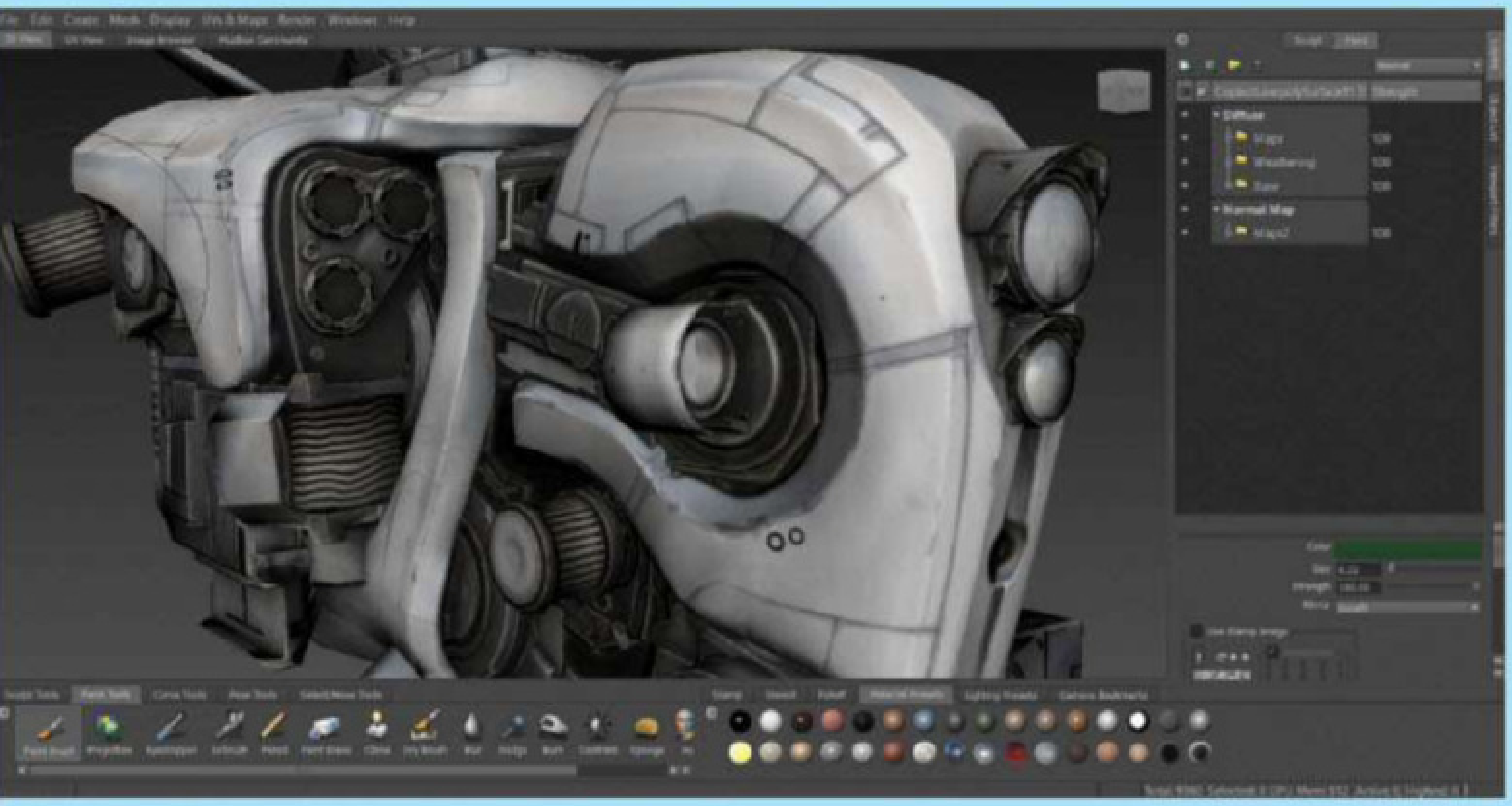
The first of the new features I tested was the symmetrical topology and PTEX interoperability with Maya 2015. First, a character that was previously sculpted in ZBrush was imported and the Retopology tool was used to create lower-resolution subdivisions. This worked very well with no problems, and you can even send the low-resolution and a higher-resolution mesh to Maya for retopology, then send the modified low-resolution back to Mudbox and replace the original via File>Send To Mudbox.

Next it was time for PTEX, which has always been appealing, since there's no need for the creation of UVs and the amount of resolution you get for texturing is impressive. Setting up and using PTEX is straightforward, as all you need to do is to go to the PTEX Setup menu, choose your desired resolution and away you go.

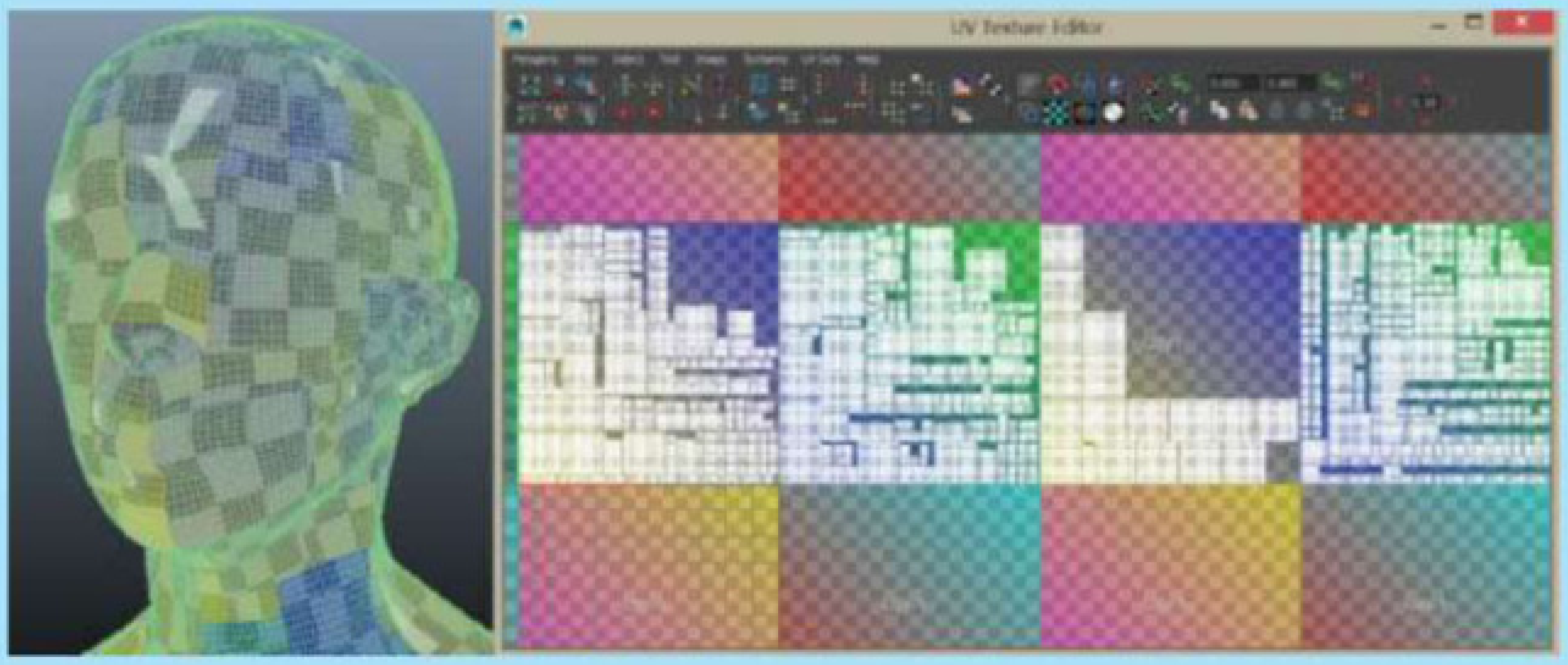
After some texturing, it was time to test the interaction between Mudbox and Maya. When using the Send To Maya button, you are immediately presented with a Set Texture Paths window. This enables the user to set the export paths for paint layers, groups and channels. This is a great feature that will help to speed up the pipeline considerably. Once sent, the model appeared in Maya only when the mouse cursor was hovered over the Import button, which seemed strange, so it was tested a few more times with the same result. Hopefully this is a bug with the PC used for this review and not with the tool.

Once in Maya, the character's PTEX UVs looked correct. However, the texture was not showing up in the viewport or when rendered in mental ray and it seems like you have to create a shader for it to work. This is very disappointing, and it would be nice if the Send To Maya function made the shader for the user, like every other Send To Maya function in Mudbox does.

The ability to transfer Blend Shapes between Mudbox and Maya is a breeze in the 2015 iteration of the software. Simply create your Blend Shapes on sculpt layers, make sure that your Send To preferences are correct and presto, your Blend Shapes are in Maya ready to do their thing.



Texturing is where Mudbox really shines and the new features have made it even shinier

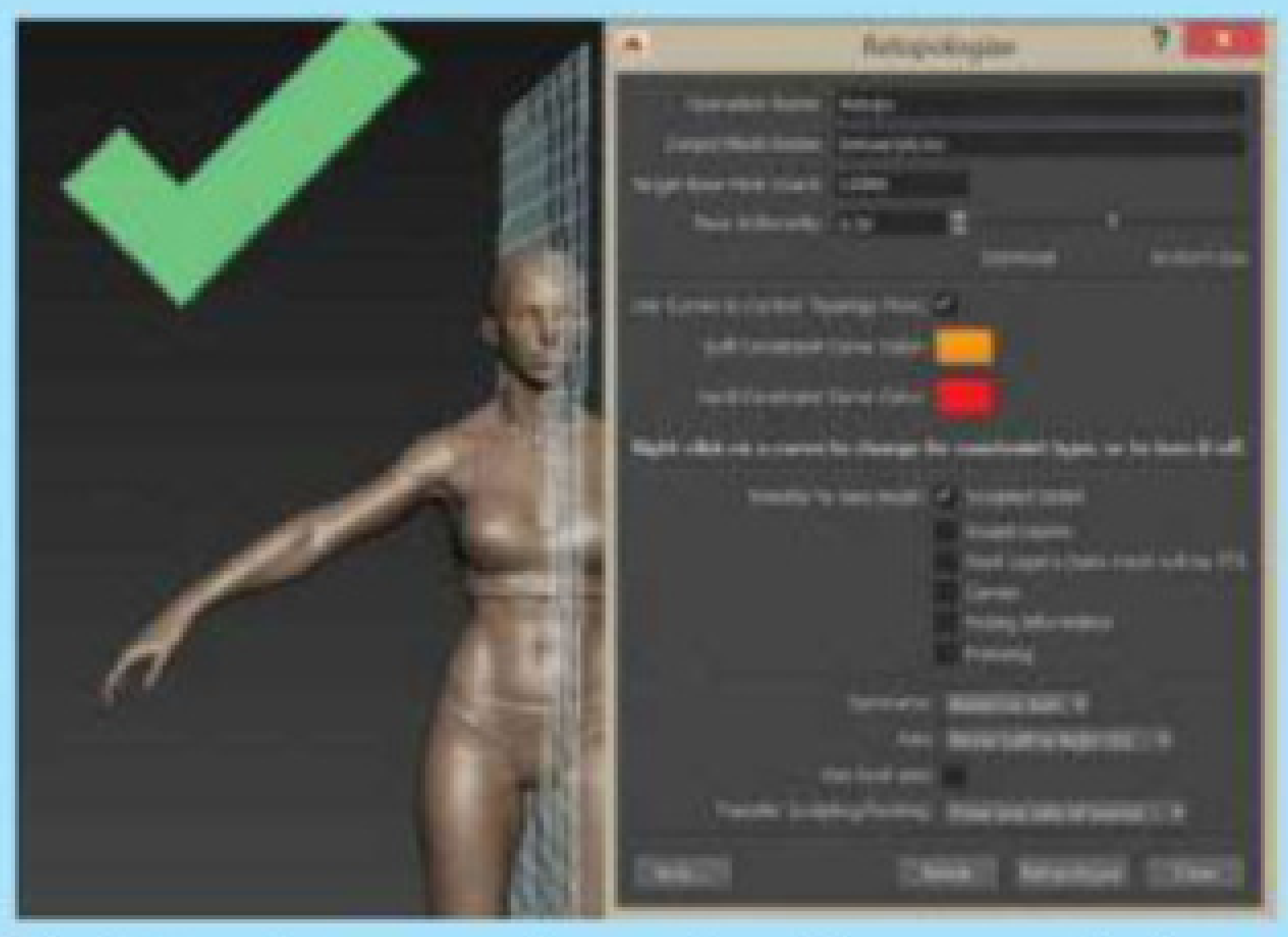


Multi-tile UVs and PTEX are so easy to set up and use within Mudbox 2015

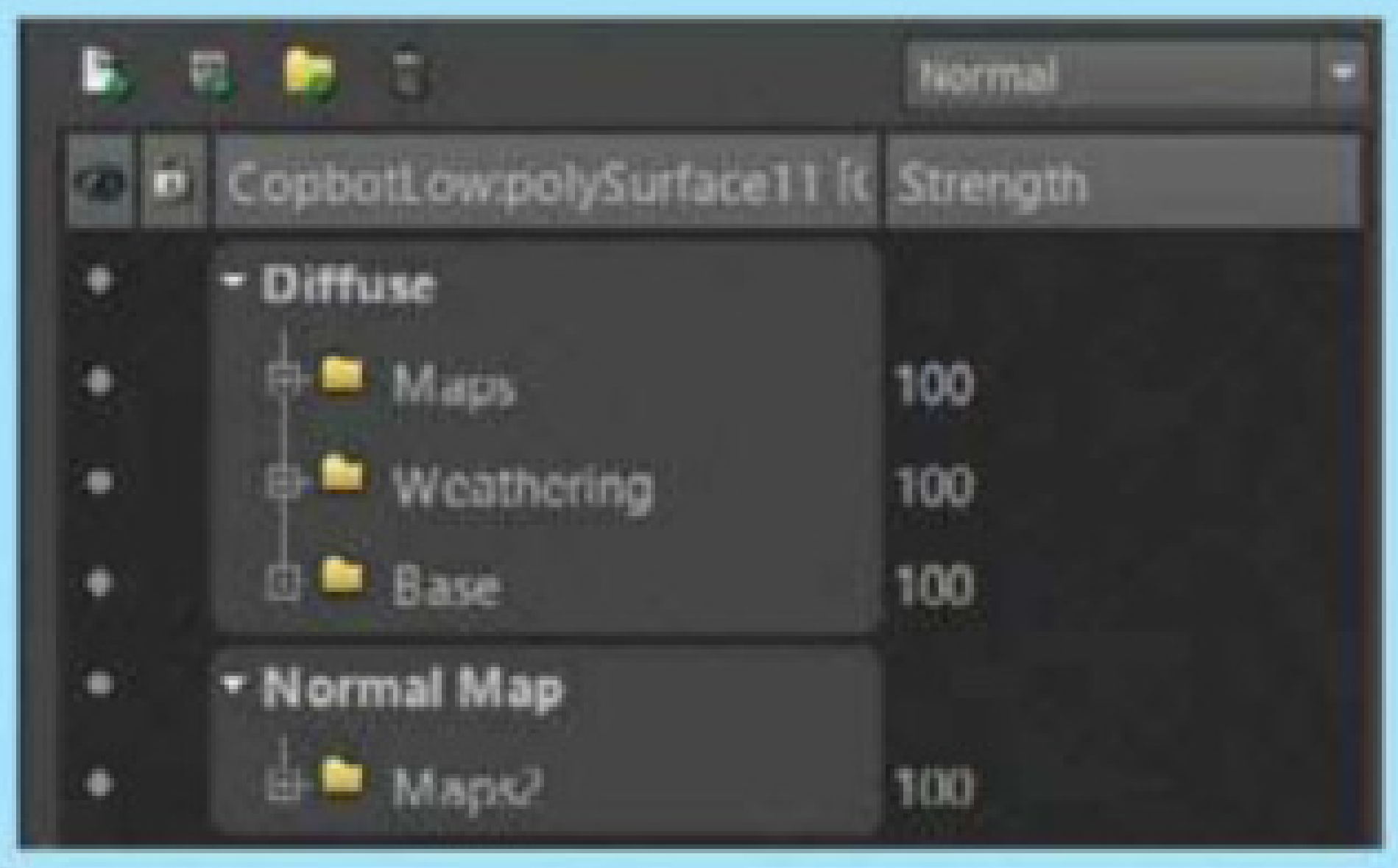
The fact that most of Mudbox 2015's new features revolve around texturing actually worked quite well with our current project, a game called *Orbitor* that is set to be released in early 2015. Mudbox's texture-painting tools are fantastic, and the ability to texture not only the Diffuse, but the Specular, Gloss, Incandescence, Opacity, Displacement, Bump, Normal and Reflection maps is extremely convenient for any 3D artist. This ability to focus on all of these maps without having to switch to a different program really helps to speed up the whole process. In a professional environment, this kind of simplicity is extremely important.

Combine all of this with the ability to send your model and textures to Maya without having to set up shaders or manage texture files (unless you are using PTEX) makes for a much more pleasurable texturing experience. On that note, Mudbox did freeze every five to ten minutes while texturing, which began to get very frustrating. Hopefully this is isolated to my test machine and not a common occurrence due to a glitch.

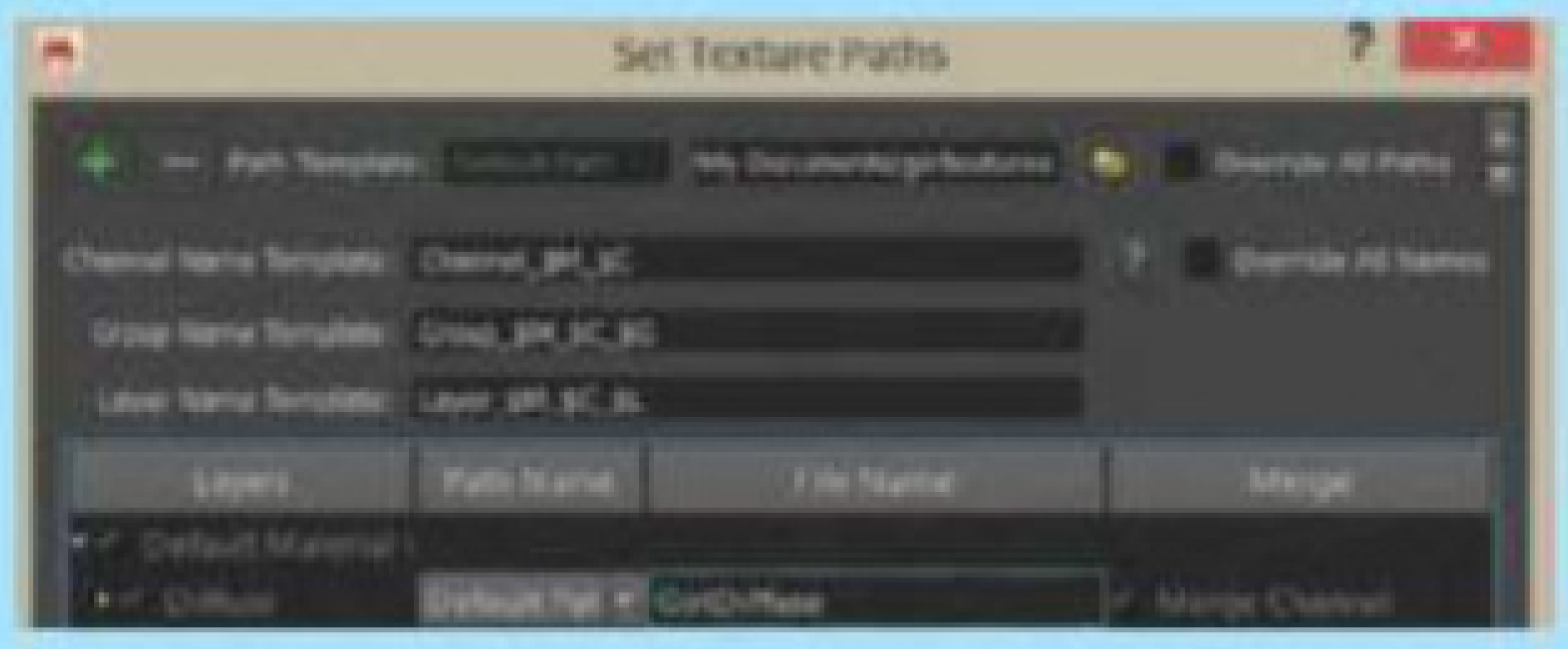
Mudbox 2015 is shaping up to be a great tool, especially in conjunction with Maya 2015, and it's certainly worth investing in.



The Retopology menu has options for symmetrical topology and asymmetrical detail projection



The new Layer Groups feature makes organising your work much simpler



The Texture Paths menu is straightforward, powerful and is a great addition to Mudbox

Essential info

Price: £425 / $495 US

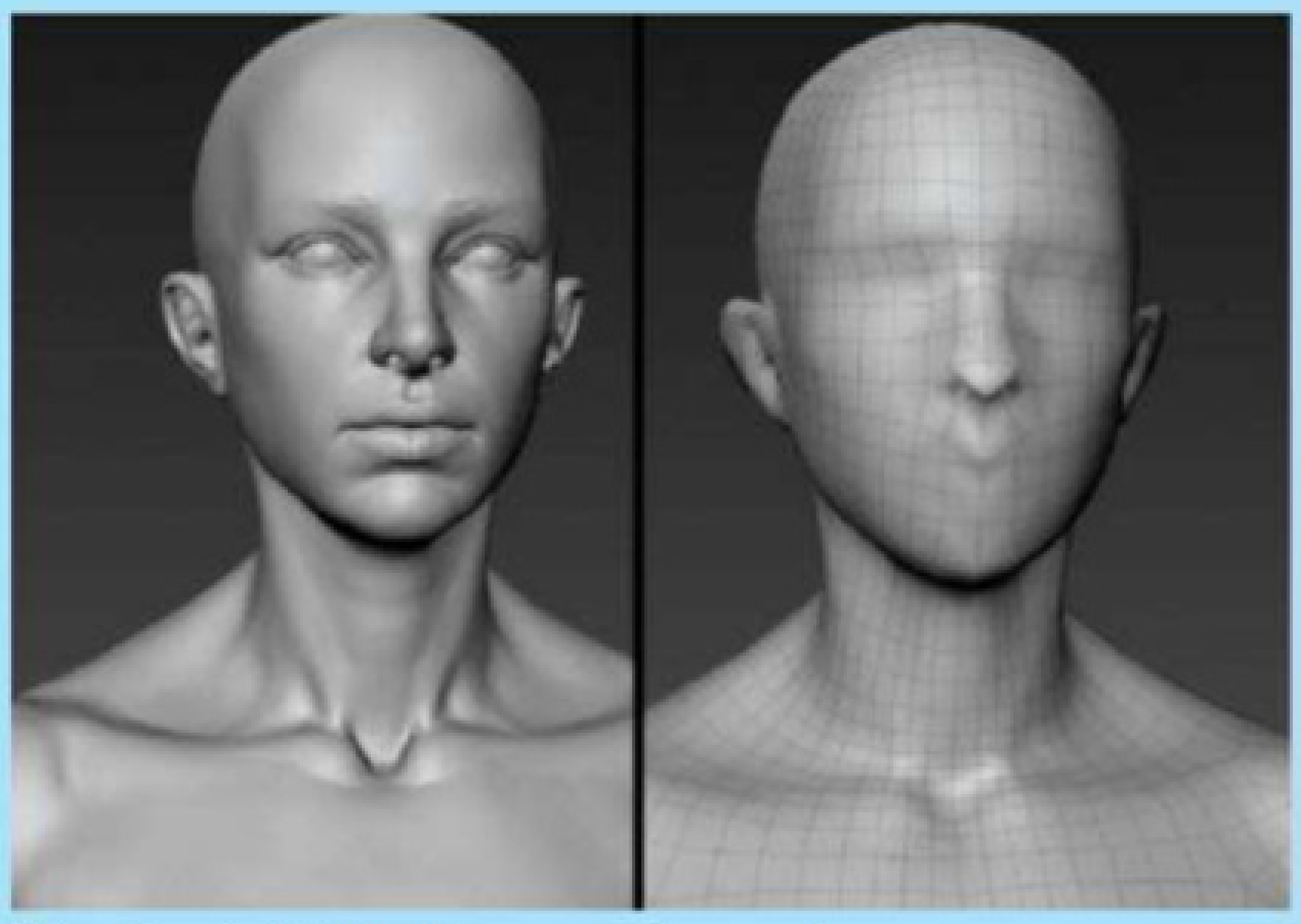
www.autodesk.com/products/mudbox

OPERATING SYSTEMS

- Windows
- Mac
- Linux

OPTIMAL SYSTEM REQUIREMENTS

- 64-bit CPU
- 4 GB of RAM (8GB recommended)
- 1GB of free disk space for install



Retopology tools in Mudbox are easy to use and now you can also keep your symmetry

The good & the bad

- ✓ Excellent texturing tools
- ✓ Easy transfer to Maya 2015 and back
- ✓ The new Texture Paths feature works well
- ✓ Blend Shapes are easy to set up and transfer

- ✗ Sculpting tools could be more refined
- ✗ It froze every five to ten minutes while texturing
- ✗ PTEX doesn't transfer to Maya as smoothly as it should

Our verdict

Features	8/10
Ease of use	9/10
Quality of results	9/10
Value for money	9/10

> "Mudbox 2015 is a great package for its price, especially if paired with other Autodesk software"

Final Score 9/10

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The ZBook 17 has a bright and vivid colour-accurate display

HP ZBook 17

HP's 17-inch mobile workstation isn't so portable, but there's no denying that it's certainly powerful

REVIEW BY Orestis Bastounis, technology writer, UK

The various models in HP's ZBook line, which come in a range of screen sizes, are separated by more than just display real estate. The 14-inch model is as thin and light as can be, but portability completely falls off the priorities list for this 17-inch variant, with a far thicker chassis that can accommodate more powerful components that make mince meat out of high-end computing tasks, such as 3D design work.

As usual, a wide range of customisation options are available. We were sent a ZBook 17 with a 2.4GHz quad-core Intel Core i7 4900MQ, an NVIDIA Quadro K4100M, 750GB hard disk and 16GB of memory, which came to almost £3,000.

If your pockets are feeling especially deep, even better specifications are available. You can have 32GB of memory, an Intel Core i7 4930MQ and a Quadro K5100M, which is one of the most powerful polygon pushers available in mobile workstations. There's space for two storage devices, with SSDs up to 512GB and 2TB hard disks.

Another highlight is the 10-bit wide-gamut DreamColor IPS display, which produces rich and vibrant colours and is a great addition for graphics professionals. HP has sensibly resisted the urge to put a high-DPI screen in the ZBook 17 – the maximum screen resolution is 'only' 1920x1200, so there are no scaling issues to worry about, while colours are exceptionally vivid.

While the thick chassis makes the ZBook a club sandwich compared with the typical Twiggy-like dimensions of Ultrabooks, it isn't devoid of style. HP has used a dual-tone dark grey for the case, with a mix of glossy and matte materials. The designers have taken advantage of the ample chassis space, with plenty of expansion ports: three USB 3, two USB 2, Thunderbolt, DisplayPort, an SD card reader and an Express Card expansion slot.

The combination of a high-end mobile Core i7 processor and NVIDIA Quadro K4100M makes the ZBook 17 one of the most powerful mobile workstations we've reviewed, which is what we expect from any larger laptop. Benchmark results indicate that the ZBook 17 really can work as a desktop replacement.

A Cinebench OpenGL score of 88.24 fps matches desktop workstations, and a CPU score of 611 is only 50 points behind HP's Xeon-powered Z1 G2. However, it's just slightly less than the score managed by the Dell M4800, reflected in longer 3ds Max render times, since it took an extra minute to render the Underwater demo scene at 1080p. This is a fairly slim difference though.

So how accurate is the screen really? We measured its brightness and colour accuracy with our trusty Spyder 4 colorimeter. 100% sRGB coverage, 97% AdobeRGB and 93% NTSC are great results, on a par with all but the highest-end of professional graphics displays. That makes it the best display that we've seen in a laptop.

Essential info

Price: £2,903
(approx. $4,950 US)

www.tinyurl.com/3DAHPZbook17

OPERATING SYSTEMS

- Windows 7 SP1 (Windows 8 optional)

TECHNICAL SPECIFICATIONS

- Intel Core i7 4900MQ
- 16GB RAM
- NVIDIA Quadro K4100M
- 750GB hard disk
- 17-inch display
- Intel 802.11n/g/b/a wireless adaptor

Despite being flagged as a portable workstation, the ZBook 17 is nowhere near as easy to travel with as the ZBook 14

The good & the bad

- ✓ Excellent overall 3D performance
- ✓ Wide-gamut, bright HP DreamColor display
- ✓ Space for two internal storage devices
- ✓ A good choice of external connectors

- ✗ Expensive

Our verdict

Features	9/10
Performance	9/10
Design	8/10
Value for money	8/10

> "The performance earns the ZBook 17 our recommendation. It's expensive, but has desktop-rivalling rendering muscle"

Final Score 9/10

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e338: The Art Of Loïc Zimmermann

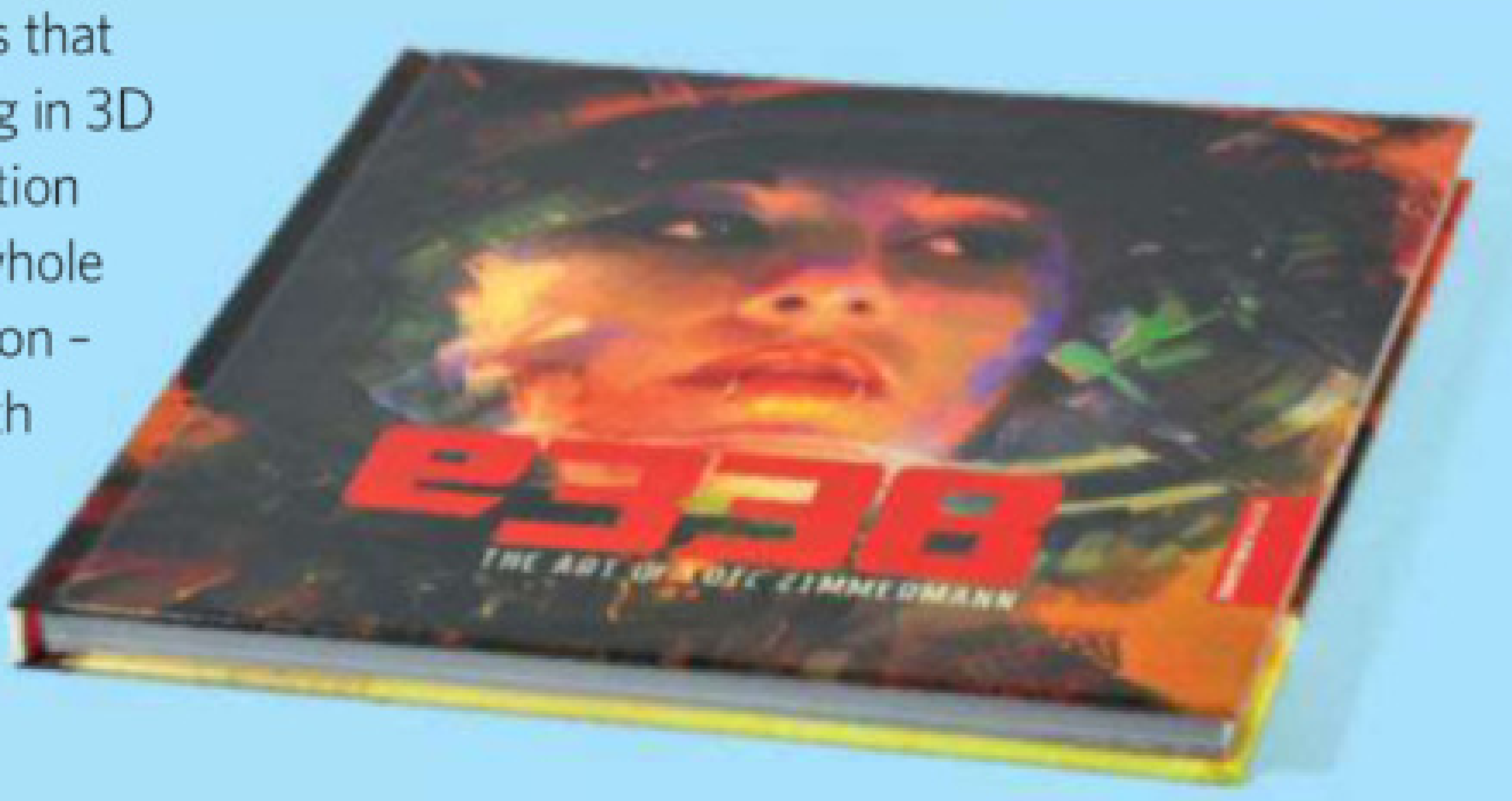
This collection of artwork by the artist Loïc Zimmermann is a great way to get inspired – and not just with 3D

REVIEWS BY Larissa Mori, 3D Artist magazine

The somewhat unusual title of 'e338', as explained in the introduction of this book, stands for the acid in Coca-Cola that Loïc Zimmermann used to drink by the gallon back in the day. In some ways, it shows. His work is hyperactively unique: expressive, surreally atmospheric, and sometimes even disturbing – all of which is showcased beautifully with the full-size images printed on every page. The layout is also designed for inspiration, featuring sections on the many mediums Zimmermann has skilfully used, from 3D to photography and silkscreen, and all with introductions from the artist.

A downside of the book, however, is that despite Zimmerman's years of working in 3D production and animation, the 3D section remains a relatively short part of the whole book. It moves on to the 'Hybrid' section – remarkable pieces that were made with more 2D than 3D and focus on illustration – in only 12 pages. You shouldn't expect to learn anything too specific about how to emulate the workflows or techniques Zimmermann used to create his impressive art, either. Though he does describe the pipeline behind a variety of his work – including *Longmen's Fall: The Tattoo Project*, where he went from scanned fragments of his own torso to a fully textured digital double with a virtual tattoo – this is not a book full of in-depth tutorials.

Of course, that's not really the point. The beauty of this book is the extensive artistic biography of Loïc Zimmermann within its pages, showcasing just what a talented artist can achieve whether they use 3D, traditional techniques, or a mixture of the two.



Info

Price: £23 / $35 US
www.3dtotal.com

AUTHOR Loïc Zimmermann
ISBN NUMBER 978-1-909414-06-8

Our verdict

Quality	10/10
Design	9/10
Overall usefulness	5/10
Value for money	6/10

> Discover how one artist combined 3D, illustration, mixed media, photography and silkscreen

Final Score 7/10

Digital Art Masters: Vol. 9

Volume 9 of the Digital Art Masters series takes an look at the method behind the madness that is CG art

If you've ever been a fan of any of the other volumes of the *Digital Art Masters* series, the latest *Volume 9* is certainly not going to disappoint. It's packed with work from 50 of the best 2D and 3D artists today – many of whom have made work you would recognise from the pages of 3D Artist magazine, and even from the front cover; such as Mathieu Aerni, Hasan Bajramovic, Mao Lin Liao, Yasin Hasanian, Dan Roarty, and Marek Denko, to name just a few.

Following a foreword from Ninja Theory senior character artist Dan Crossland, *Volume 9* is divided into Characters, Scenes, Cartoons, Sci-fi, and Fantasy sections, with each of the artists in a section taking several pages to introduce themselves and their finished work, then offering a description of the pipeline and the techniques they use to create digital art with plenty of WIP images.

While it may not be easy to follow for beginners in 3D as it does assume some previous knowledge, *Digital Art Masters: Volume 9* is an excellent way to learn some of the workflow secrets that the best artists use today, and to compare how you work differently to them. It may seem like a fairly hefty price to pay, but we think it's worth it!

Info

Price: £32 / $54 US
www.3dtotal.com

AUTHOR Various
ISBN NUMBER 978-1-909414-08-2

Our verdict

Quality	10/10
Design	9/10
Overall usefulness	9/10
Value for money	9/10

> Another great introduction to a batch of very talented and experienced artists and how they create their work

Final Score 9/10

Samurai
Hasan Bajramovic

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Argentina's animation, *The Unbeatables*, is stepping out onto the field with an English-speaking cast

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Shotgun Software

Autodesk buys Shotgun as an investment in its vision for the company's future

inside

> “He does so little with his face muscles and yet tells so much – we spent hours analysing that”

Juan José Campanella Founder of 100 Bares Producciones. Page 108

Character designs and render from The Unbeatables
100 Bares Producciones/ Mondo Loco
After winning the Oscar for Best Foreign Film in 2010, 100 Bares Producciones has revealed a new animation, *The Unbeatables*

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Along with the launch of Double Negative's new Animation division in Vancouver, the new studio will have access to talent in its London and Singapore facilities as well as the production and technology infrastructure already present in India

Double Negative and Prime Focus World merge

Double Negative and Prime Focus have joined to become a new, intimidatingly large worldwide VFX company

Prime Focus Limited has just announced the merger of its subsidiary Prime Focus World with Double Negative. As a studio that recently received its largest VFX commission to date as the exclusive VFX partner on *Sin City: A Dame To Kill For*, Prime Focus World also established a new office in Beijing last year, and is well-known for being a leading player in India's VFX market with an 80,000 square-foot Mumbai facility. This merger has resulted in a combined entity that will become one of the largest integrated VFX, 3D conversion & animation services studios in the world.

The new VFX business will trade under the Double Negative name and brand, and will be led by DNeg's current management team of Alex Hope and Matthew Holben.

"This is a transformational event – both for the companies involved and for the industry," said Prime Focus founder and CEO of Prime Focus World, Namit Malhotra. "Prime Focus has proven over the last five years the undeniable benefits of global collaboration: the flexibility of working in different time zones, the coming together of creative talent from across the globe, and the ability to leverage tax incentives. We can now bring this together with Double Negative's unquestionable creative excellence to build a truly formidable offering."

The deal certainly seems to be going extremely well so far. Established in 1998, Double Negative is Europe's largest independent VFX house with honours including an Academy Award for *Inception* and two BAFTAs, and with a combined order book of around $150 million, the company will be in a strong position to sustain growth while taking advantage of tax subsidies, putting Prime Focus World in a position to generate more than double the revenue. This should also reduce debt by about 30 to 40 per cent over the next four to six quarters. Already, Prime Focus stock has hit a 52-week high following the merger.

Reliance MediaWorks buys 30 per cent stake in Prime Focus

A few days after the announcement that Prime Focus World was merging with Double Negative, Anil Ambani's Reliance MediaWorks has reportedly acquired a 30 per cent stake in Prime Focus, with the trio forming a group with over 5,500 people across 20 locations, offering services such as visual effects, stereo 3D conversion, animation and cloud-based digital media solutions for the film, advertising and television industries.

For more details please visit **www.dneg.com** or **www.primefocusworld.com**. The press release can be found at **www.moneycontrol.com**

● **HAVE YOU HEARD?** • **Universal is opening a new China office, headed by Hollywood studio executive Jo Yan**

VFX Reference Platform

A new platform to streamline work is out now

The very first of its kind, the VFX Reference Platform represents one of the closest collaborations yet between 3D software providers to provide a common platform.

The VES's Reference Platform is essentially a set of tools and library versions that will be used as a common target for building software in the VFX industry – helping to minimalise the incompatibilities between different software packages artists see today.

It will also ease the support burden for Linux-based pipelines, as well as encourage more software companies to adopt the open-source operating system in the future. The Reference Platform will be updated annually by a group of the software vendors in collaboration with the VES Technology Committee.

"The VES has been collaborating with Autodesk and other software vendors to create a reference Linux platform to address the endemic hassle of 'version-itis'. We're thrilled the VES is taking the lead to rally both the visual effects community and vendors on the Linux platform," said Chris Vienneau, Autodesk M&E director of product management.

The Reference Platform, along with further supporting information is available on **http://vfxplatform.com**

SIGGRAPH winners

Nine winners have been picked for SIGGRAPH 2014

The 41st annual Computer Animation Festival in Vancouver – which is recognised as a qualifying festival for the Academy Awards – showcased more than 100 of the best examples of computer animation from the past year, accepted out of the 450+ submissions SIGGRAPH had received. Only nine winners have been announced, including those for the new categories that have been added to recognise and incorporate a larger variety of branches of computer animation.

The Best in Show winner was 'Box', directed by Tarik Abdel-Gawad from Bot & Dolly. The film explores the combination of both real and digital worlds through projection-mapping on moving surfaces. You can watch the short online at www.vimeo.com/75260457, or see the making-of video at www.youtube.com/watch?v=y4ajXJ3nj1Q.

See more information about the winners on the SIGGRAPH site at **www.siggraph.org/discover/news/computer-animation-festival-winners-announced**

Pixomondo expands

The company continues to expand its Canadian presence

According to Facebook group Pay Us Pixomondo, as of this June several freelancers that had worked for the company in 2013 had still not been paid for their work

Well-known for having created the visual effects behind HBO's *Game Of Thrones* along with winning an Oscar for its work on Martin Scorsese's *Hugo*, Pixomondo announced it will be moving to a building at Revival 629, a film-studio lot in Toronto.

Just last year, the German company shut down operations in London, Berlin, and Detroit as part of a company-wide restructuring process. They now join a host of other foreign VFX studios, such as Framestore, Cinesite, MPC and Sony Pictures Imageworks, by putting more focus on Canada and taking advantage of the generous tax incentives offered.

Software shorts

Bringing you the lowdown on product updates and launches

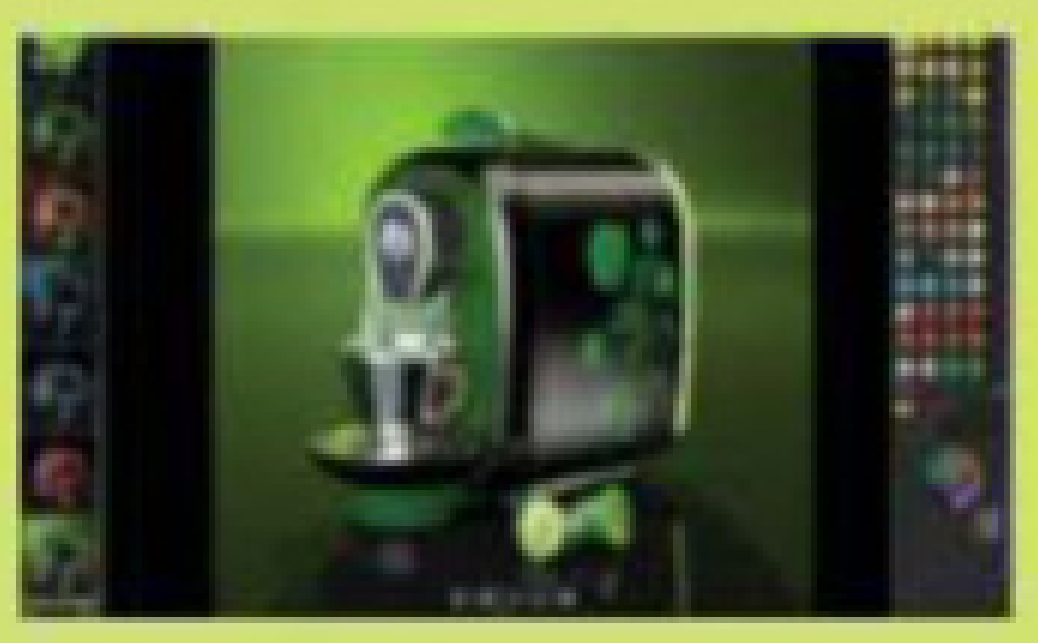
RHiggit V2

RebelHill has released RHiggit! V2, a new update to TD Craig Monins's popular suite of LightWave rigging and animation tools aimed at artists. New features include Free, Lite, Pro and Studio editions ranging from free to £999; high-quality rig presets to suit characters of different shapes and sizes; and a custom, modular auto-rig builder. Learn more on the website at www.rebelhill.net/html/rhiggit.html.

FurryBall 4.8

The FurryBall team has released version 4.8 of FurryBall, its real-time GPU production quality unbiased, as well as biased, final-frame renderer. It is now available for Maya, 3ds Max and now also CINEMA 4D, with all plug-ins free for all users. See more at http://furryball.aaa-studio.eu/news/furryball48Released.html

The Foundry COLORWAY



The Foundry has announced the release of COLORWAY, an application that improves the speed and efficiency of the design process by giving users access to a simple environment where they can develop looks of 3D objects and scenes, then share a selection of iterations with clients. A COLORWAY kit for MODO is available today, while a kit compatible with CINEMA 4D will be available soon.

Autodesk acquisition

The software giant signs a definitive agreement to acquire Shotgun Software

Learn more on Shotgun's site at **www.shotgunsoftware.com/goingfaster** or at **www.autodesk.com/campaigns/shotgun**

Autodesk and Shotgun have both assured users of Shotgun's product tracking, review, and asset-management software that there are no plans to change what they love about Shotgun.

Shotgun Software co-founder Don Parker explained on the company's website that a year ago he began talking to potential investors about an investment that would allow Shotgun to double the engineering team, and Autodesk was interested in making the long-term backing to accelerate its development and vision. "We didn't set out to sell the company; we set out to scale our team so we can build tools for you faster. And that's exactly what we're going to do," stated Parker.

● **DID YOU KNOW? • Guillermo del Toro has announced an upcoming Pacific Rim animated series, out in 2017**

Project Focus

The Unbeatables

Argentina's animation The Unbeatables is stepping out with an English-speaking cast

Project *The Unbeatables*
Studio 100 Bares Producciones / Mondo Loco
Description A shy boy tries to get his dismantled foosball team back together
Company bio 100 Bares Producciones was founded in 2004 by Juan José Campanella. In 2010 the company won the Oscar for Best Foreign Film, *El Secreto de Sus Ojos*. Mondo Loco is the animation house that was previously known as Catmandu Studios
Country Argentina
Websites
www.100bares.com
www.mundolococgi.com

Contributors

Juan José Campanella
Director

Richard Smith
Principal screenwriter

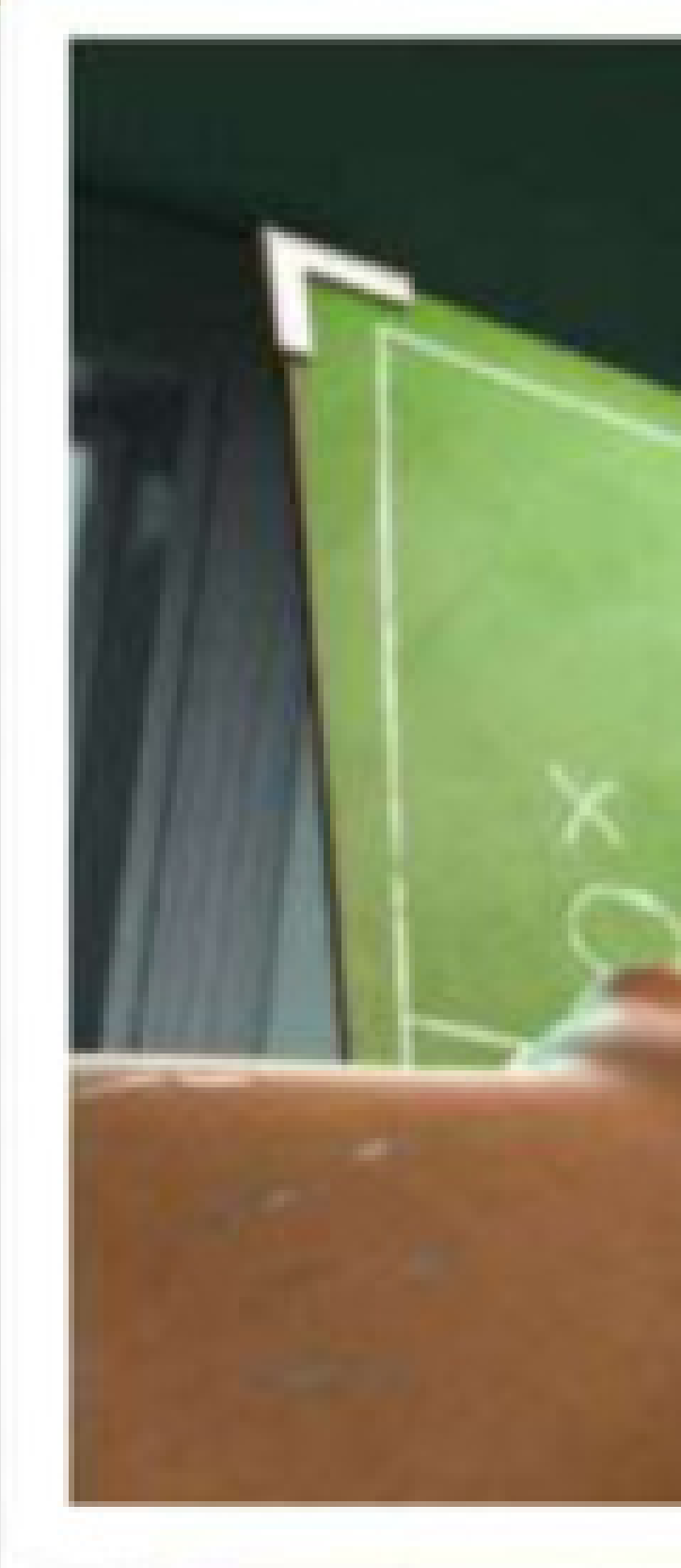
Called *Metegol* on release in its native Argentina, *The Unbeatables* is the latest animation to hit the big screen. It's full of the great imagery, characters and jokes that audiences now expect from full-CG features, but it's still a little different from a Pixar or DreamWorks show.

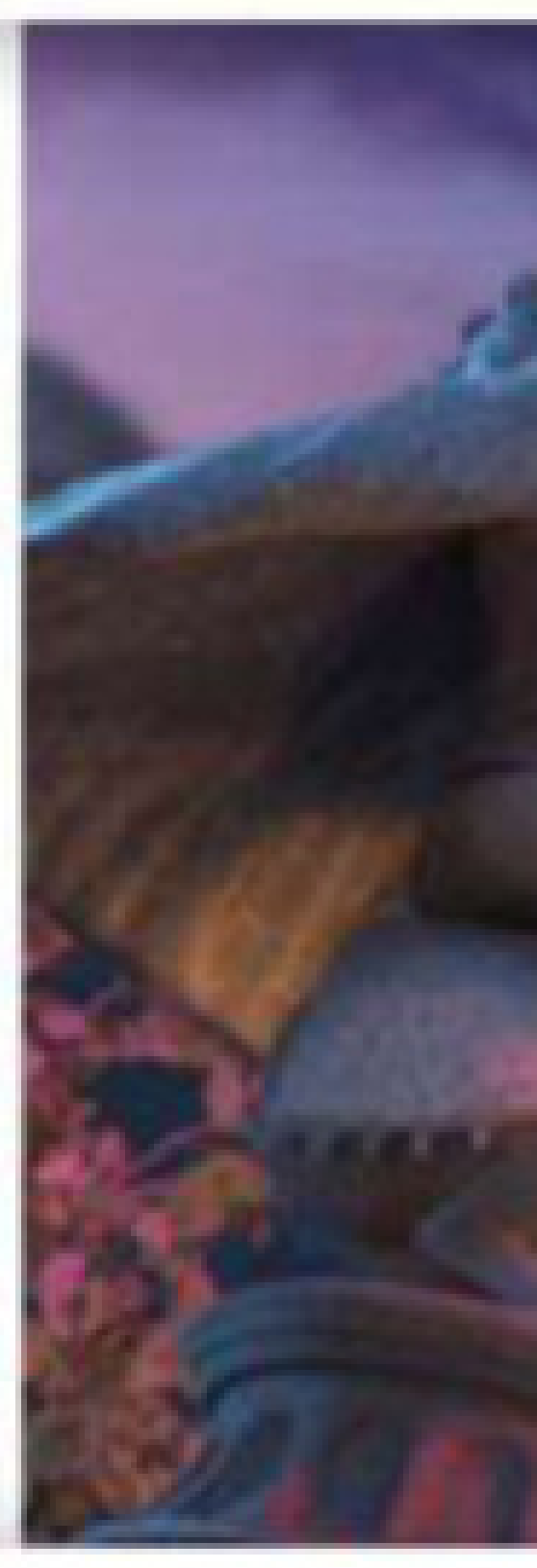
First, although it's the most expensive Argentine movie ever made, costing a rumoured $22 million, that's a tiny amount by Hollywood standards. Second, *Metegol* wasn't made in English. It was made in Spanish and has been recast and re-recorded for the English-speaking world, with Rupert Grint in the lead role of Amadeo and Peter Serafinowicz, Rob Brydon and Anthony Head in support.

Juan José Campanella and his production company, 100 Bares, have a live-action track record, so there was a lot to learn when they sat down with animators Mondo Loco (then Catmandu Studios). Campanella didn't want just to match Hollywood animation, he wanted to "break a little ground in terms of performance, nuances in the emotions of the characters. Coming from live action, I found that most people working in animation use other animated movies as references." Instead, Campanella went back to classic live-action films, with Orson Welles' performance in *Othello* being a particular inspiration. "He does so little with his face muscles and yet tells so much. We spent hours analysing that," explains Campanella. "The look on Laura's face when she sees Amadeo running for the goal towards the end of the movie mimics Ilsa Lund watching Victor Laszlo singing the Marseillaise in *Casablanca*."

Campanella says they spent the first six months of the production finding its style. Gaston Gorali, the executive producer at Mondo Loco, says the animation was "fluid, yet precise," with "no overacting and no over-animating." The team were working in Maya, and one of the biggest challenges was framing, given the difference in scale between the human characters and the foosball players. Another foosball-related challenge was creating players who were unique and distinctive, but also exactly the same shape. The VFX was done in Argentina too, with Campanella adding that they "worked with Prana Studios, in India, for the lighting, texturing and rendering."

However, the biggest challenge for the team was to think like a child: first of all, what a child would find funny and would understand, and second, "There's the issue of responsibility. In terms of message, sarcasm, irony, and so on. All those adult elements that enrich the story and make it fun for the parents might be traps when it comes to kids." Ultimately, Campanella hopes that his sweet tale of foosball and friendship can appeal to both young and old, and can stand the test of going up against the big, blockbuster Hollywood animations out there.



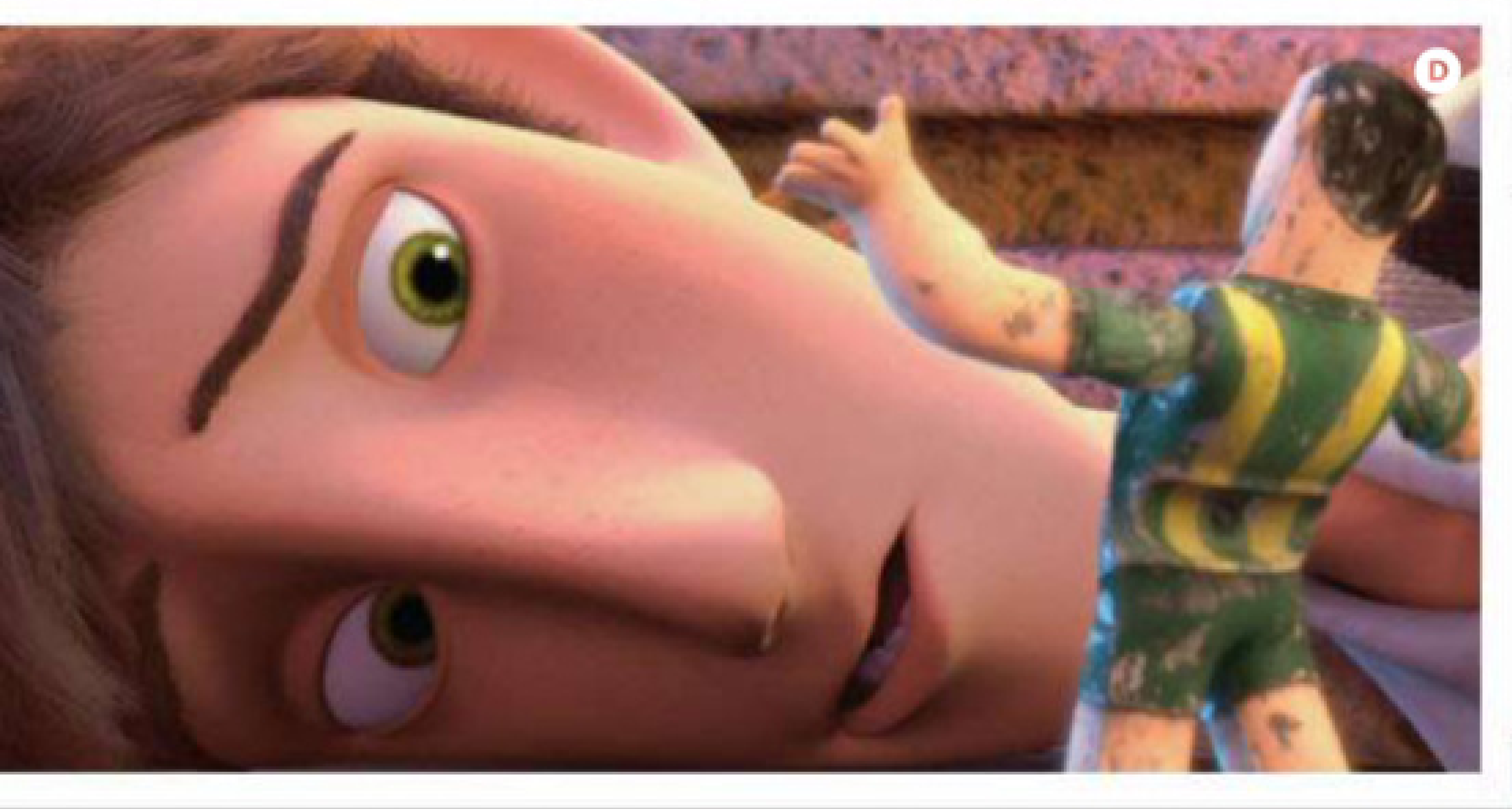


> "All those adult elements that enrich the story and make it fun for the parents might be traps when it comes to kids"
> **Juan José Campanella** Director

Ⓐ One of the struggles faced by the team when creating the film was creating the kind of imagery that would appeal to both children and their parents. What might seem funny and meaningful to a child might not to an adult, and vice versa

Ⓑ Rewriting took Richard Smith several months. The aim was to do it before the actors went into the studio, but "inevitably there was still some rewriting required on recording days in order to ensure the delivery pace fitted perfectly with each beat to the bar"

Ⓒ "Everyone I've spoken to who's seen the film has not realised it wasn't originally made in English, so my compliments come in the form of no one noticing what I've done," enthuses screenwriter Richard Smith about the sound dub



Shaping the words

Screenwriter Richard Smith on the challenges of rewriting for an English-speaking audience

"The animation was only altered in a few isolated places, mainly to replace Spanish words on screen with the equivalent in English. Rewriting the script to fit the 99.8 per cent of pre-existing original animation was an incredible challenge – almost beyond the reach of adequate description! Not only did we have to rewrite the film and create new jokes with punchlines for an English-speaking audience imbued with British references, but we were also constrained by timing – with timing being a key component in comedy – and also the mouth shapes! A big movie screen is unforgiving to the wrong vowel sounds being orated by characters, so we had to select only syllables that fitted all the lip-syncing criteria exactly. This meant writing and rewriting, then sandpapering down lines until they fitted exactly."

D The team was prepared to do some reanimation to match the English language overdub if needed, but thanks to some very meticulous rescripting very little was actually required in the end

E Campanella and his team looked to classic films for inspiration. One was *Casablanca*, which influenced the subtle movements of one character's face

F One of the biggest challenges that Richard Smith faced in translating the script was staying faithful to the mouth movements of the original and fitting the script around it

G Most of the animators on the film were Argentine or Spanish, although the international team included Americans, French and Italians among many others

Studio Access

Shotgun Software

We talk to Shotgun Software about joining with Autodesk and its vision for the future

SHOTGUN

Shotgun Software was founded in January 2006 by a group of visual effects professionals to build production tracking and pipeline solutions. The founding members worked together on a major studio animated feature, and are developing Shotgun to fill the growing industry need for a commercially viable system for managing complex projects spread across multiple studio locations

www.shotgunsoftware.com

Country USA
Main software Shotgun Software

"Shotgun Software formed about eight and a half years ago," recalls co-founder and CEO Don Parker. "A group of us were working on a Disney feature animated film called *The Wild* as part of the pipeline team. We were already integrating with tools before the time of NUKE, back in the days of Shake. After that project, we started the company with focus on production management and tracking."

Working with several VFX studios both large and small and building tools to help artists work faster meant that Shotgun could learn how studios thought about productions and the naming conventions they used. Most studios at this time had their own in-house project management solutions. "Each one was doing a lot of related work. We began to see patterns – eighty per cent of what they do is similar and about 20 per cent is different," explains Parker.

Shotgun then began iterating the system in partnership with clients. "It's always felt like a team effort. We're building for them and with them. As the production platform started to evolve, we realised that there were other key pieces we could build, like review and approval, making it easy for artists and leads to view work together. It's an expensive bottleneck to have, because in the past it slowed down artists and supervisors." Tools such as Tweak's RV and cineSync, which are now key components, were integrated. "Next we started asset management, which is hard to do, but after working with studios, we began to understand how to productise what everyone was building," continues Parker.

Shotgun Software's acquisition by Autodesk is a move aimed at providing the resources and investment needed to meet the future demands of the industry. "We've grown as a company. Two years ago, we did an investment with Autodesk, which got our relationship moving forward," states Parker.

> "My whole goal was to double the size of Shotgun's engineering team"
> **Don Parker,** Co-founder and CEO

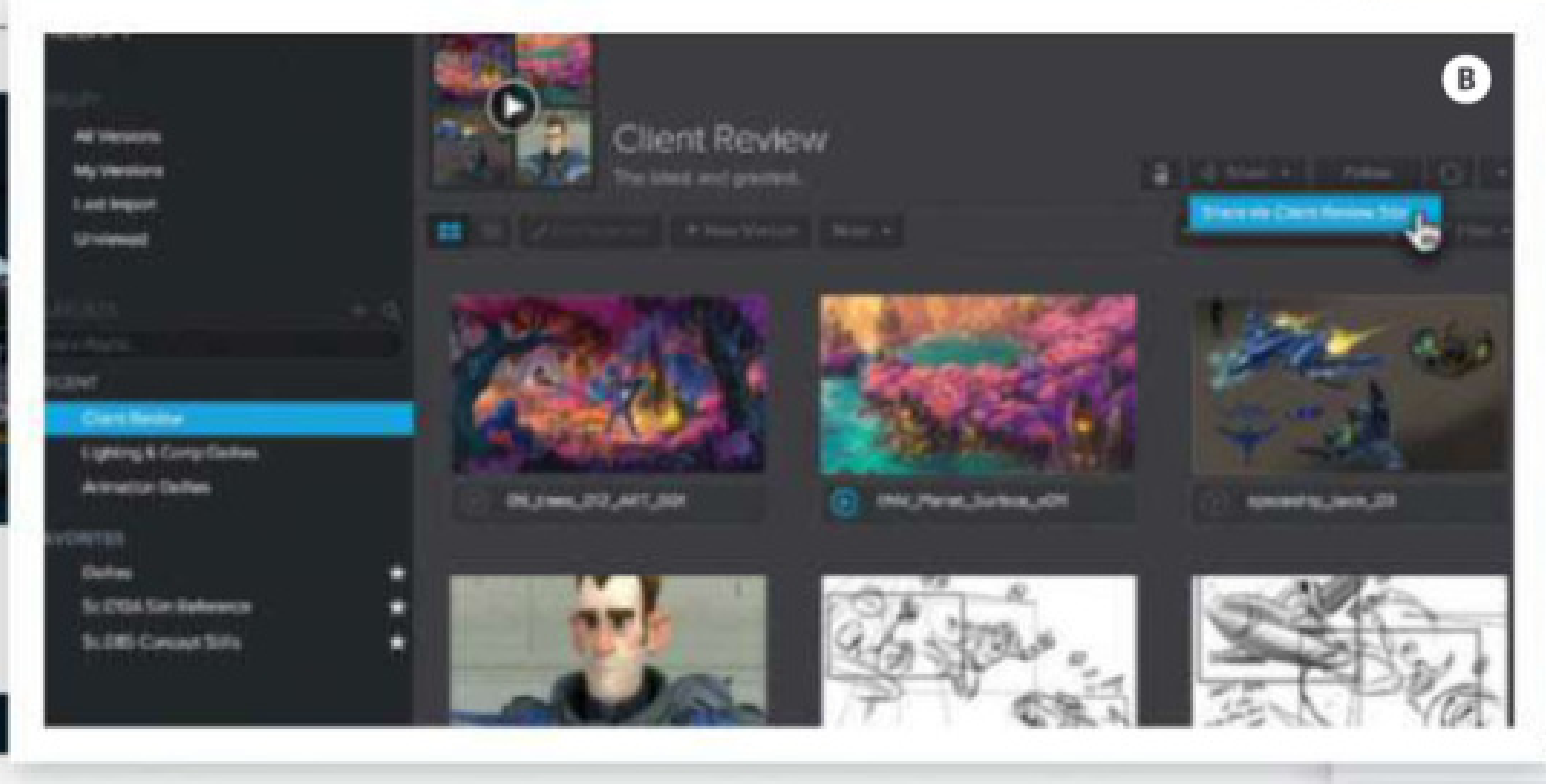
Recognising studio demands, changing workflows, and clients trying to adapt and collaborate with partners and locations around the world, Shotgun returned to Autodesk for further collaboration. "We had discussions with Chris Bradshaw, M&E and Marc Stevens about how the two companies could work together to do it faster. They had a team of awesome engineers doing R&D similar to what we were doing; platform, web, DCC (Digital Content Creation) integrations. My whole goal was to double the size of Shotgun's engineering team." However, the acquisition has exceeded that by actually *tripling* the engineering team size.

"When Shotgun came along, we were interested," says Maurice Patel, Autodesk M&E industry manager. "The team had production experience, understood the problem, and knew how to solve it, which was

Contributors

Don Parker
Co-founder and CEO

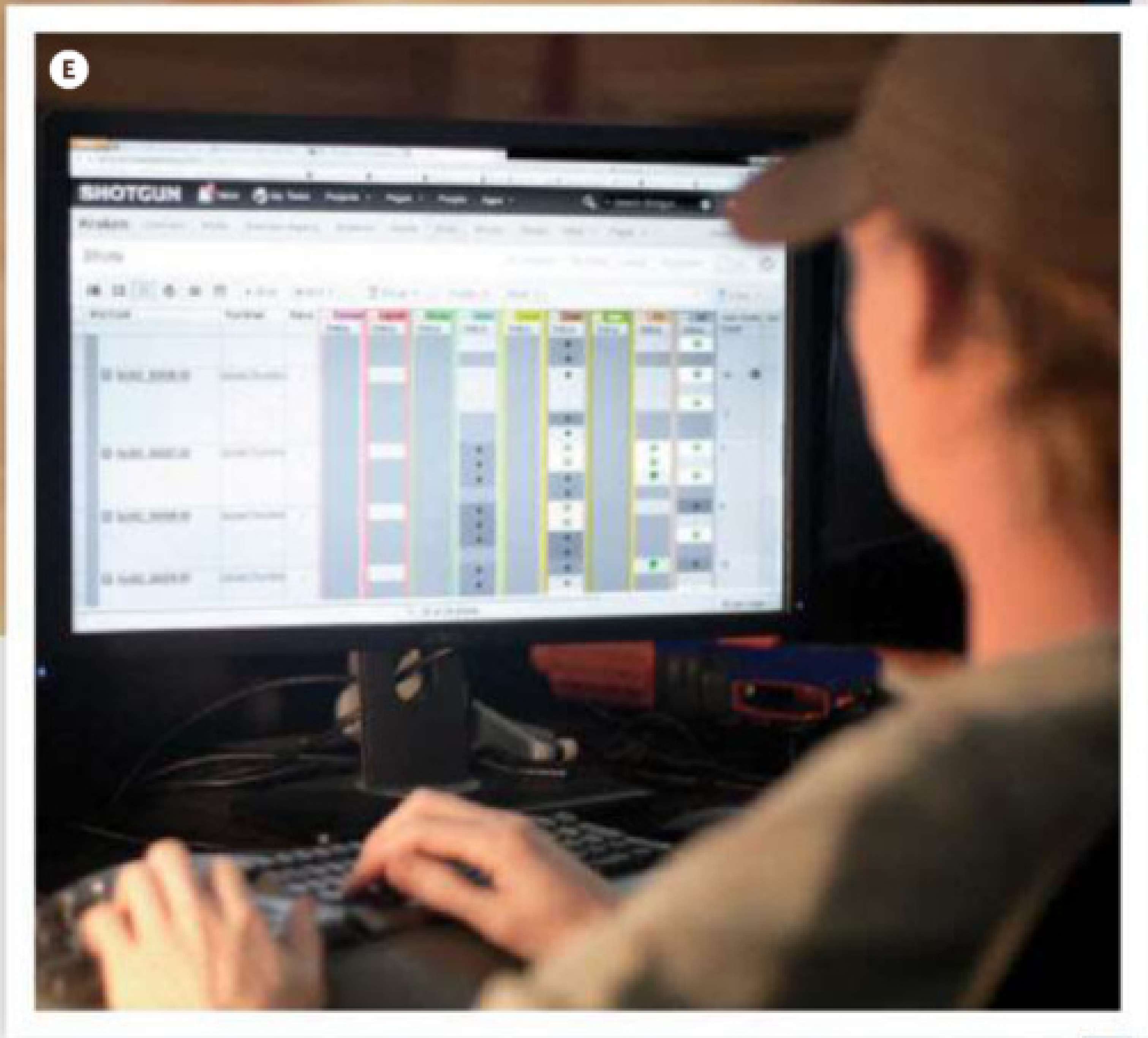
Maurice Patel
Autodesk M&E industry manager

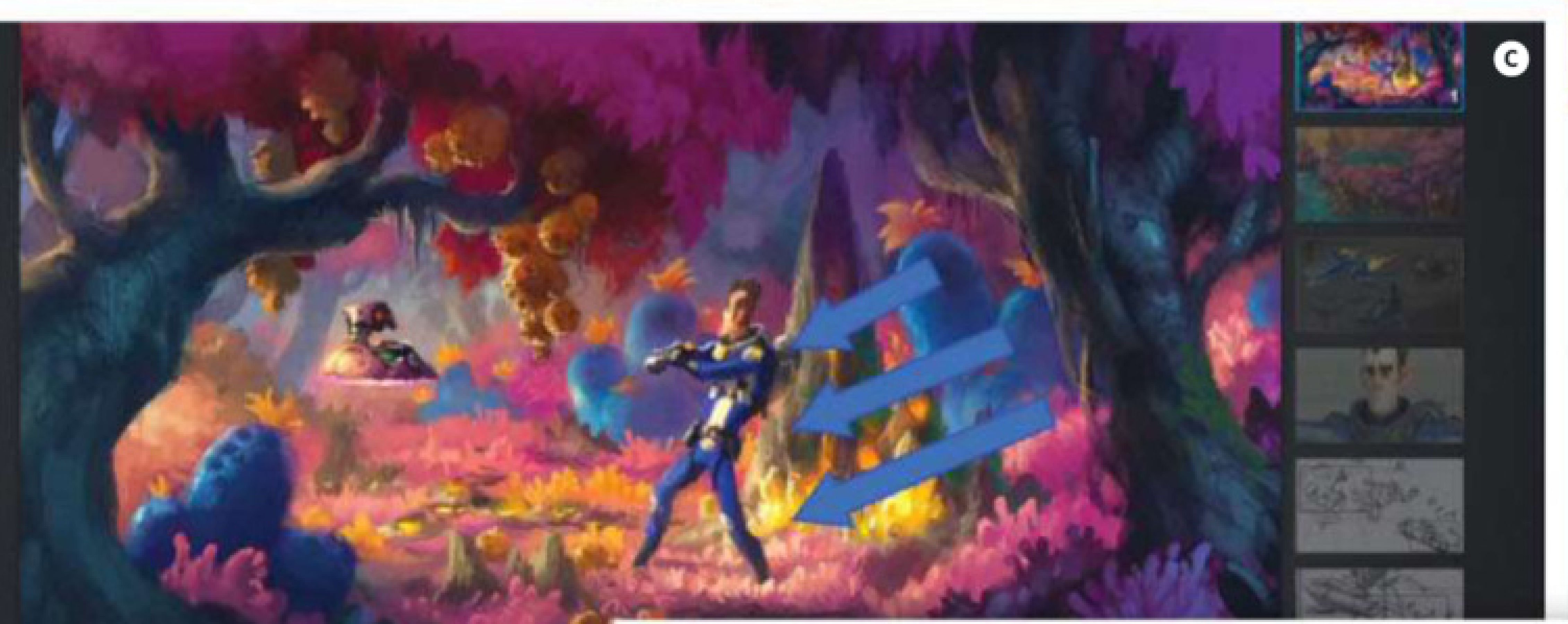


portfolio highlights

Here are some of the big projects Shotgun Software has been used on:

2014 *300: Rise Of An Empire*
2014 *Captain America: The Winter Soldier*
2013 *Frozen*
2013 *Gravity*
2013 *American Hustle*
2013 *Sleepy Hollow*
2013 *Need for Speed Rivals*
2013 *Battlefield 4*
2012 *Diablo 3*





attractive in the way they work with customers and how they do development in the thick of production instead of an abstract setting. The Shotgun team, who came from a production background, has that experience to solve those problems in the heat of the moment. I think it will help solve what we believe is a fundamental problem. Shotgun has the right philosophy in how it builds its tools – it's a collaborative approach."

Shotgun's main theme at this year's SIGGRAPH will be on review and approval and its pipeline asset-management tools, as it regards these as the current big bottlenecks in production.

Ⓐ 240 artists at 16 VFX vendors contributed to *COSMOS: A Spacetime Odyssey*, and Shotgun helped to manage the massive shot volume during the production process and kept VFX deliverables on schedule

Ⓑ The Shotgun Media tool lets users drop media to be reviewed directly into the browser, add it to a playlist and click Share. The playlist is published to a secure page on the studio's site designed for client presentations

Ⓒ The Shotgun Client Review Site toolset enables companies to share media with clients securely, with one click, through free, unlimited client accounts. All feedback is tracked and recorded

Ⓓ Jorge Miranda and Ingrid Campos of Cluster Studio bringing assets into Maya using the Pipeline Toolkit Loader app. The Loader supports Maya, NUKE, 3ds Max, Photoshop and MotionBuilder

Ⓔ Jeff Beeland at Blur Studio working in Shotgun. Blur has standardised on Shotgun for production management and tracking and plans on further integrating the software into daily use

✓iPad ✓iPhone ✓Android phone ✓Android tablet ✓Apple Mac ✓Windows PC

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SIGGRAPH 2014

DISCOVER THE FUTURE OF CG AT THE YEAR'S BIGGEST 3D EVENT

FEATURED INSIDE

THE TECH OF TOMORROW
The most exciting technology at SIGGRAPH revealed

3D PRINTING
What can we expect from the next generation of printers?

AMD POWERS THE FOUNDRY
How 3D cards can supercharge NUKE, MARI and MODO

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SIGGRAPH 2014

Vancouver Convention and Exhibition Centre

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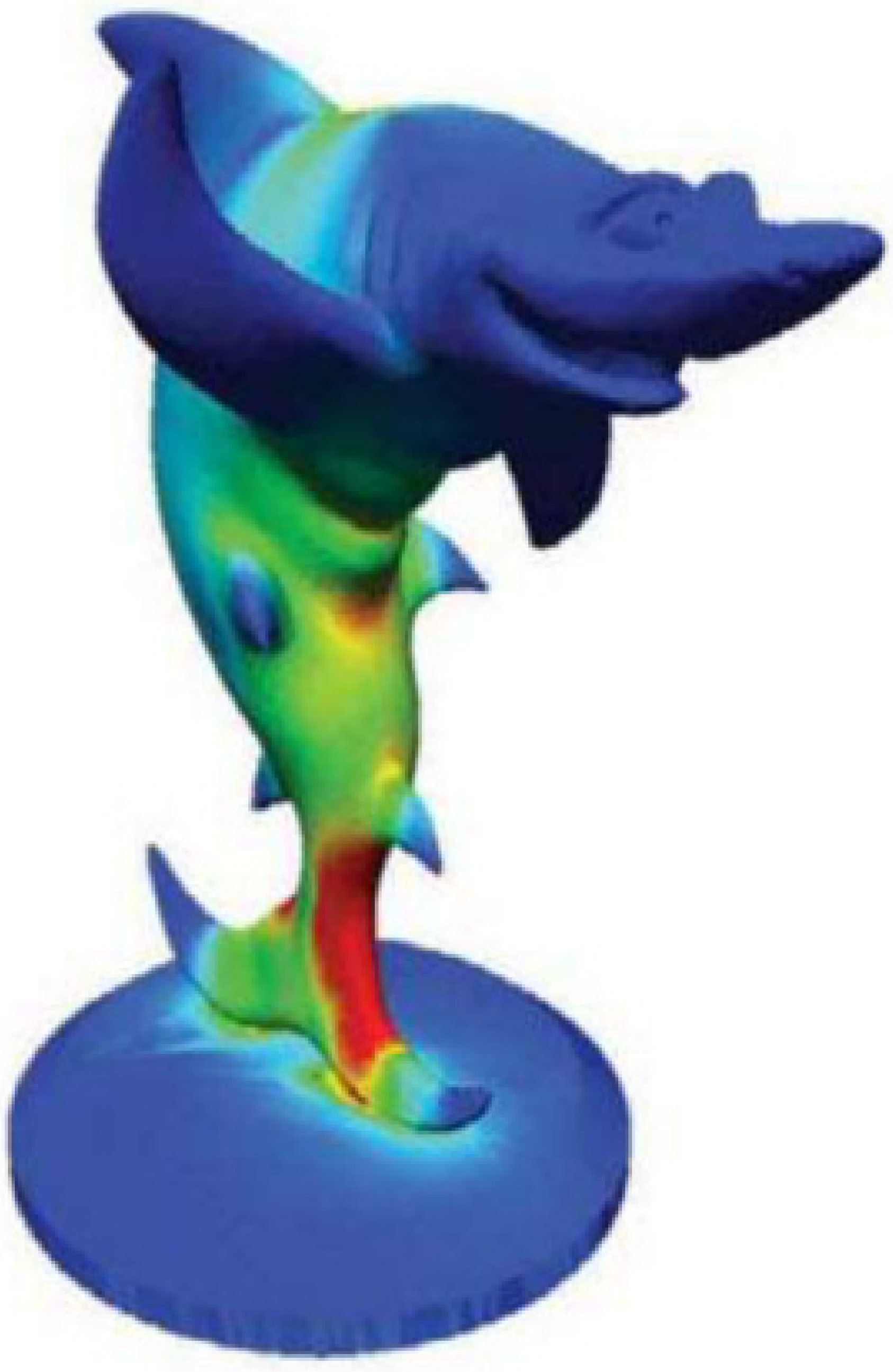
Cover star

David Domingo Jiménez

www.ddjimenez.com

David Domingo Jiménez is a Spanish freelance CG artist, specialising in texturing and modelling. He has around a decade of experience in animation, VFX and commercials

An introduction to SIGGRAPH 2014



Vancouver isn't just Hollywood North, where LA decamps to shoots its features with a little more peace and a lot more tax breaks: it's also a CG hotspot in its own right. An enormous amount of film and games work is done in the Canadian city, which cultivates a thriving hub of artists and developers with a real community feel. That's just one of many the reasons SIGGRAPH is returning to the location this year, only three years after its last visit north of the border.

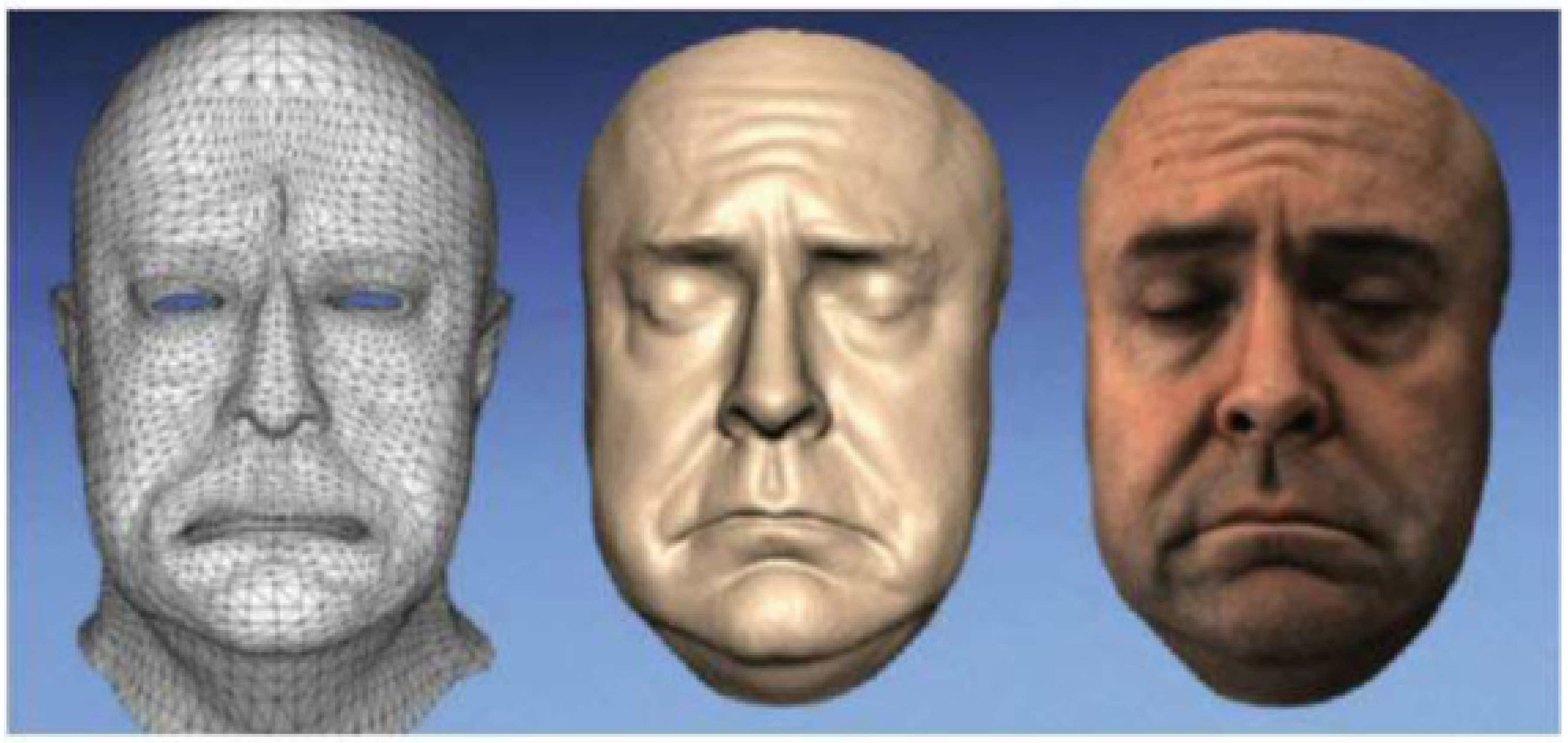
Vancouver is the perfect setting for SIGGRAPH 2014, and that's not just because its surrounding ocean and mountains are beautifully picturesque. For this year's SIGGRAPH chair, Dave Shreiner, the landscape is also somewhat symbolic – Vancouver brings technology and nature together just as SIGGRAPH unites science and art. The latest conference is Shreiner's 26th time at the annual CG celebration, and he says Vancouver remains one of his favourite SIGGRAPH locations.

New to this year's conference is a heightened focus on mobile technology, a move spearheaded by Shreiner. "I view mobile as more than just technology; it's the fusion of several capabilities" he says. "In a modern mobile smartphone you have a high-res, full-colour display; a HD-capable movie camera; high-performance GPUs; a GPS; accelerometers; multiple processors; and connectivity to all the data the internet has to offer, right in the palm of your hand. The SIGGRAPH community has multiple research areas that work to pioneer those technologies. It is my hope that SIGGRAPH 2014 will foster greater convergence of those research areas to make even better experiences, particularly when it comes to mobile devices."

Still, it's not all about mobile. Read on, and find out exactly what SIGGRAPH 2014 has to offer anyone interested in digital art, games, technology, movies, virtual reality and more – the whole CG shebang in one place, one time of the year.

THE FUTURE OF CG

at SIGGRAPH 2014



PERFECTING FACES

With the eyes being the windows to the soul, and human facial features probably being the trickiest thing for animators to tackle, it's no wonder that the Technical Papers section of SIGGRAPH has a strand entirely devoted to faces. One session, entitled Facial Performance Enhancement Using Dynamic Shape-Space Analysis, will consider methods of capturing the subtle defamation and timing details encountered in an individual's facial movements. The team – from Disney Research Zürich, ETH Zürich, Université de Montréal and Harvard University – has pioneered a technique that "adds fine-scale spatio-temporal details and expressiveness to low-resolution, art-directed facial performances, demonstrated on various forms of input."

THE CHALLENGES OF HAIR SIMULATION

Hair is hard. Bald men and hairdressers know that, but so does anyone who works in 3D. A session called Adaptive Nonlinearity For Collisions In Complex Rod Assemblies hopes to help with this. Breannan Smith and Eitan Grinspun (Columbia University), Danny Kaufman (Adobe Systems Incorporated), Rasmus Tamstorf (Walt Disney Animation Studios), and Jean-Marie Aubry (Weta Digital) have come together to present this paper in the Hair And Collisions strand. The paper addresses the strongly nonlinear behaviour of thin-body collision response with "a simple, adaptively nonlinear time-stepping algorithm to incorporate sufficient nonlinearity in collision-response modelling. This enables stable simulations at timesteps several orders of magnitude larger than previously possible."

STOCHASTIC SPARKLES

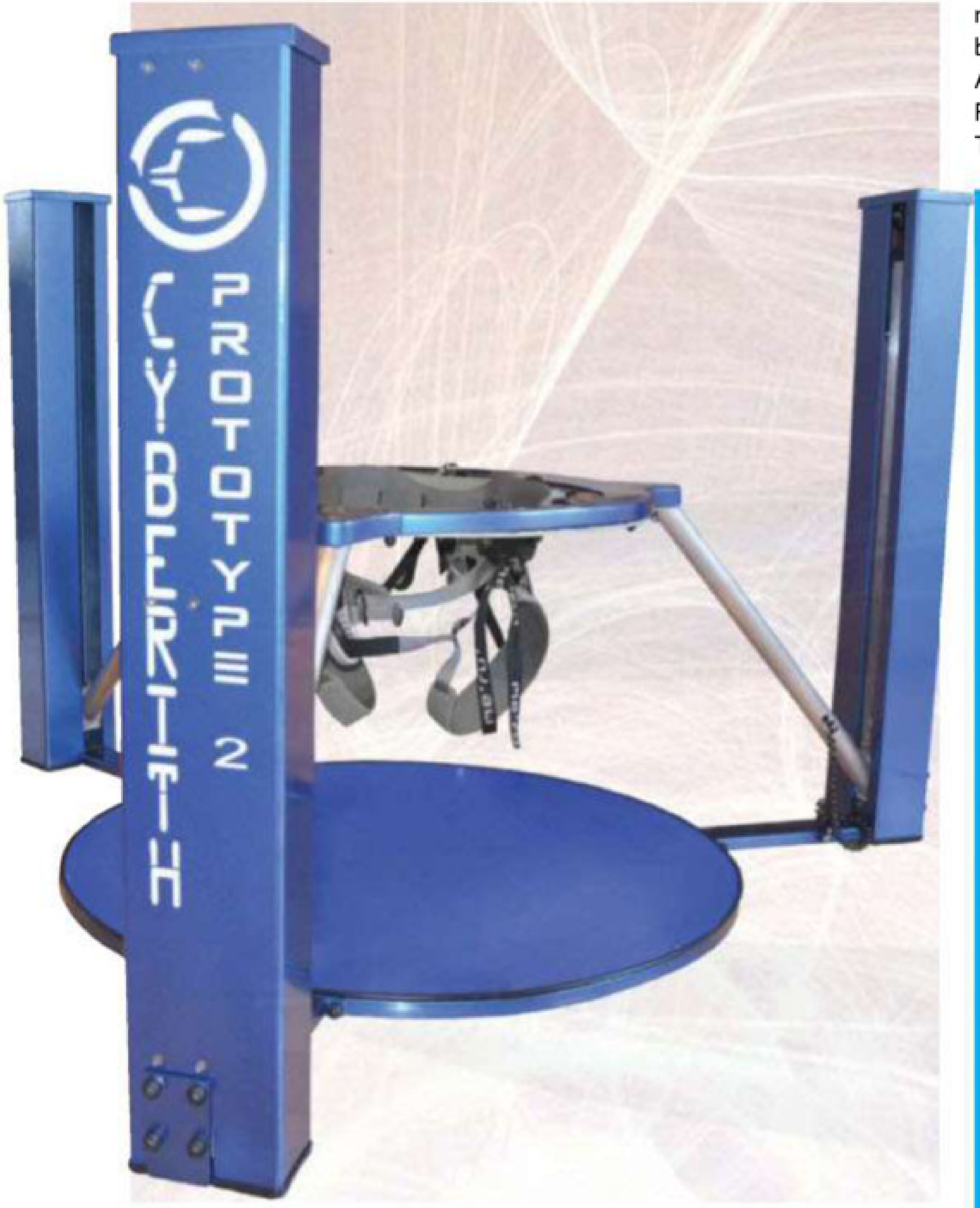
Want to stand out with sparkles? Then the session on Discrete Stochastic Microfacet Models is for you. This talk will take place as part of the Reflectance: Modelling, Capturing, Renderings section of SIGGRAPH's Technical Papers. It covers a modified microfacet BRDF that "simulates effects collectively referred to as 'glitter' or 'sparkle' by treating a surface as being covered by a finite number of point scatterers. It is readily implemented in standard rendering systems and converges back to the smooth case in the limit." The authors of the paper are Wenzel Jakob (ETH Zürich), Steve Marschner (Cornell University), Ling-Qi Yan, Milos Hasan, Ravi Ramamoorthi (all three from University of California, Berkeley) and Jason Lawrence (University of Virginia).

INK-AND-RAY

While the rapid development of 3D animation over the last few decades has been tremendously exciting for artists and their audiences, there are plenty of people who still enjoy traditional 2D animation. SIGGRAPH caters for them too. What's interesting about Ink-and-Ray: Bas-Relief Meshes For Adding Global Illumination Effects To Hand-Drawn Characters, which is taking place in the Non-Photorealistic Rendering section, is that it demonstrates how concepts learnt in 3D can also be applied back to traditional techniques. The team (from Czech Technical University in Prague, University of Pennsylvania, Brno University of Technology, ETH Zürich and Walt Disney Animation Studios) says, "This ink-and-ray framework enables production of a richer look for traditional animation by enhancing hand-drawn artwork, using Global Illumination effects previously only found in complex 3D pipelines."

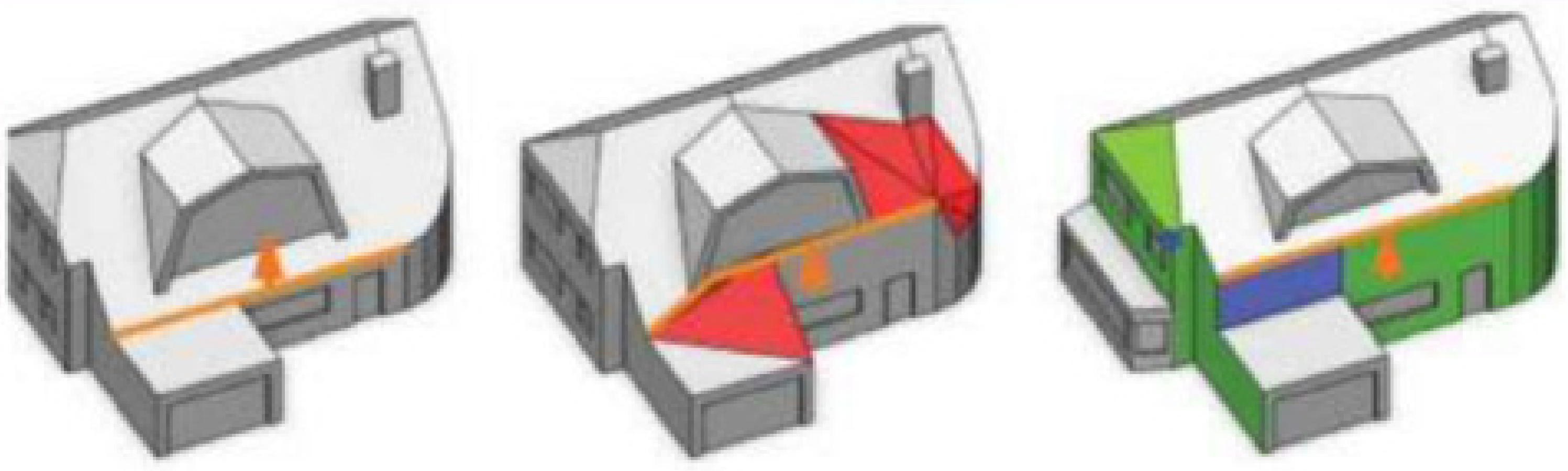
DRAWING A CROWD

The Animating Characters strand of the Technical Papers is bound to be popular, and the Interactive Manipulation Of Large-Scale Crowd Animation session will be hoping to gather crowds as big as those in its subject matter. Its team of authors (from Seoul National University, Hanyang University and Weta Digital) describe the work as a "novel cage-based editing method for interactive manipulation of large-scale crowd animation. The cage encloses animated characters and supports convenient space/time manipulation. Examples demonstrate how the cage-based user interface mitigates the time and effort required to manipulate large crowd animation." Other big demos in the Animating Character strand include Robust And Accurate Skeletal Rigging From Mesh Sequences, and Interactive Generalised Penetration Depth Computation For Rigid And Articulated Models Using Object Norm.



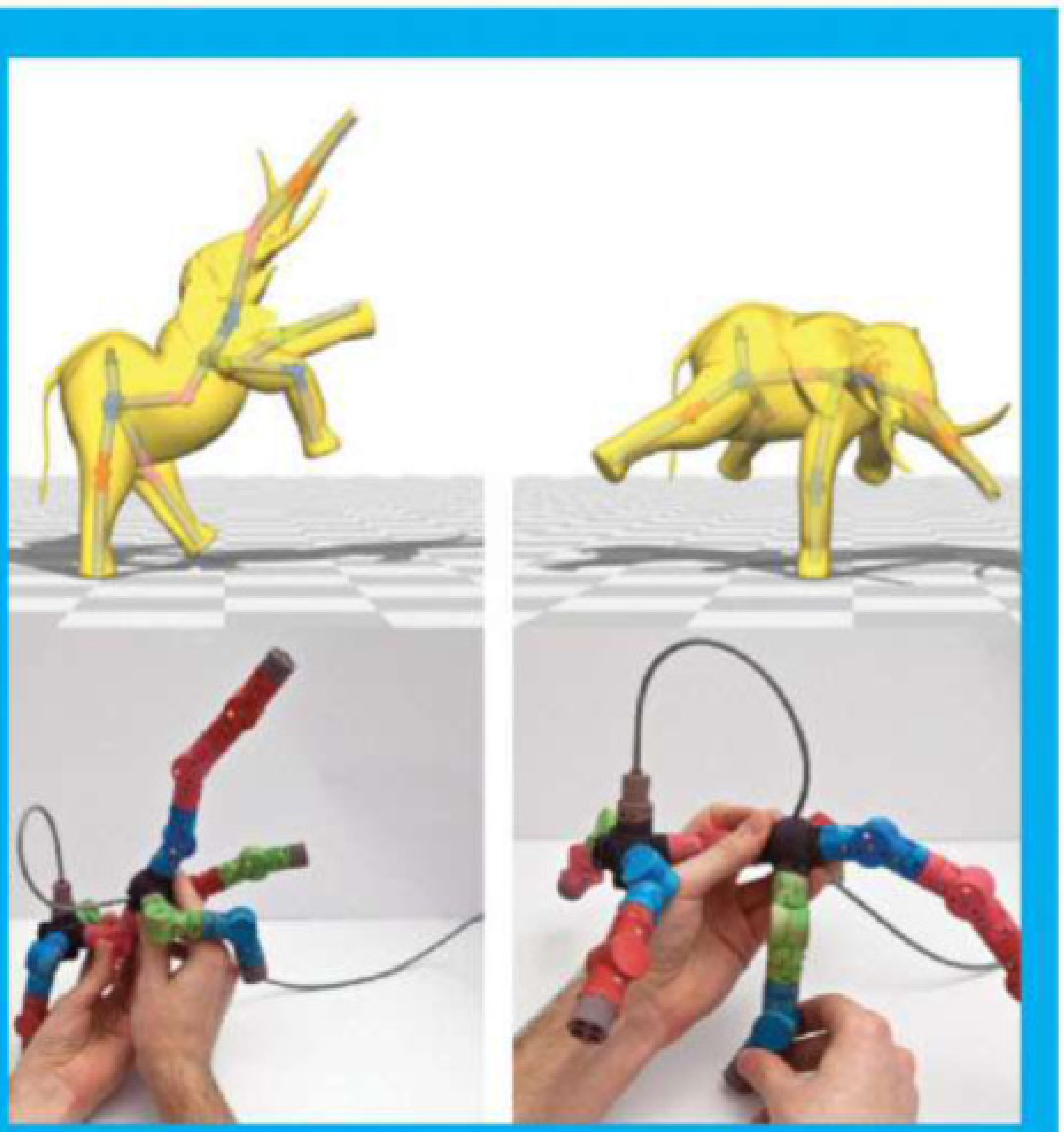
VIDEOGAMES 2.0

Another part of SIGGRAPH where you can see the work that might change the 3D landscape is over at Emerging Technologies. One item of particular interest in 2014 is the Cyberith Virtualizer, a locomotion device designed to enable users to better experience virtual reality when playing videogames. It has an omni-directional treadmill, enabling the user to get physically involved in the game and augmenting the sense of immersion. As part of this curated section of the festival, you can go along and try out the technology for yourself. Whether you're interested in the technology you'll be designing for the future, or you just want to try out a new way of playing videogames, this shouldn't be missed.



FASTER MODELLING

Interactive Modeling forms the subject of another of the strands in the Technical Papers presentation, with the PushPull++ session sounding particularly intriguing. Quite simply, PushPull++ is a 3D-modelling tool that enables the user to build quickly and to adjust arbitrary meshes with slanted surfaces. The idea is that it "reduces the required clicks for common modelling tasks up to an order of magnitude compared to leading commercial tools." PushPull++ was developed by Markus Lipp and Pascal Müller from Esri, and Peter Wonka from King Abdullah University of Science and Technology. Other interesting talks include Flow-Complex-Based Shape Reconstruction From 3D Curve Sketches and True2Form: 3D Curve Networks From 2D Sketches via Selective Regularisation.



INNOVATING INPUTS

Appearing in both Emerging Technologies and the Technical Papers is the Tangible And Modular Input Device For Character Articulation. The team from ETH Zürich and Georgia Tech Lorraine wanted to tackle the challenges of articulating 3D characters with standard 2D interfaces. The project "demonstrates a tangible input device composed of interchangeable, hot-pluggable parts. Embedded sensors measure the device's pose at rates suitable for real-time editing and animation. The device provides input for character rigging and automatic weight computation, direct skeletal deformation, interaction with physical simulations, and handle-based variational geometric modelling."

Remember, if you're interested in the Technical Papers but you're not sure which to see, you can visit Technical Papers Fast Forward, where the authors have less than a minute to sell you on their ideas!

THE FUTURE OF 3D PRINTING at SIGGRAPH 2014

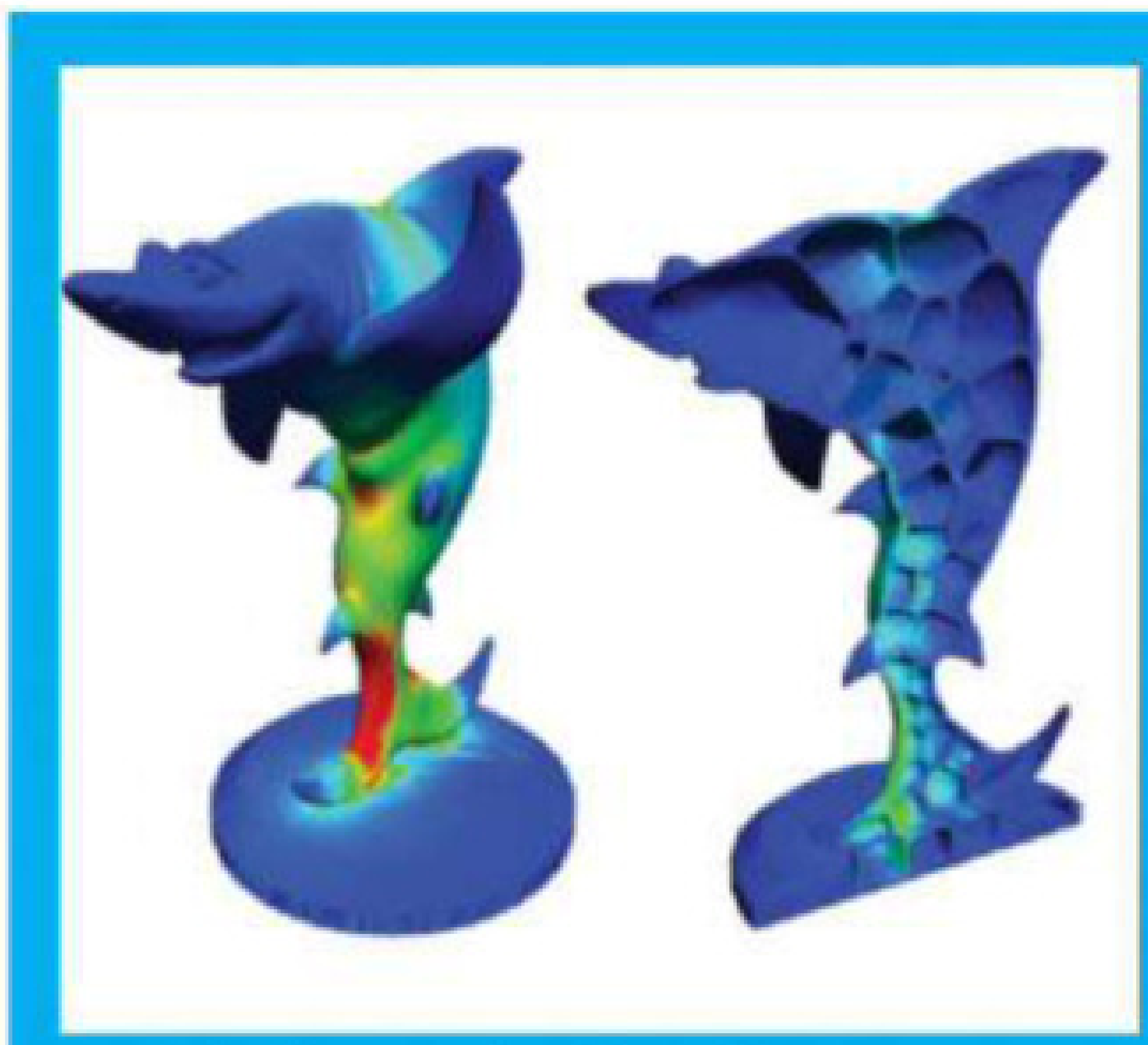
GET IT IN CONTEXT

Inevitably, 3D printing is one of the hottest topics at SIGGRAPH this year, and there are various ways you can engage with the issues and witness the progression of the technology. As a great introduction to the subject, Will Walker from Formlabs will be giving a studio talk called Out Of The Screen: 3D Printing And Design. Formlabs has a high-resolution personal 3D printer, the Form 1, and Walker intends to demonstrate how the production of high-fidelity digital artwork has grown rapidly. He will discuss "the history of manufacturing, the shift to digital fabrication, and the emergence of 3D printing as a means of production."

LAIKA PRESENTS

The Oregon-based animation studio behind *ParaNorman* and *The Boxtrolls* is to hold a production session on its world-class workflow, entitled The Seamless Fusion Of Stop-Motion And Visual Effects Technologies. As Georgina Hayns, creative supervisor of puppet fabrication, and Brian McLean, director of rapid prototype, will explain, 3D printing is a vital part of the Laika pipeline. Topics the duo will touch upon include the advancements in colour 3D printing and how they have enabled puppet builders to break free of previous design limitations; the use of 3D printers to pre-vis puppet construction and test how different materials perform; and the use of in-house-developed silicones that are pushing the boundaries of stop-motion. If you're involved in 3D printing, don't miss this one!

BUILT TO LAST



Appearing as one of the Fabrication Technical Papers is a new 3D printing scheme from a team at the Shandong and Ben-Gurion Universities. The paper is called Build To Last: Strength-to-Weight 3D Printed Objects, and it promises to reduce the material costs of a given object while still producing a strong product. Indeed, as 3D printing becomes more popular and increasingly accessible, this could be one of the critical issues. The new method will print "a durable model, resistant to impact and external forces by leveraging honeycomb structure. The method employs an adaptive centroidal Voronoi volumetric tessellation and harmonic carving to maximise the strength-to-weight ratio."

3D SCANNING FOR 3D PRINTS

3D Scanning For Personal 3D Printing is a studio course run by Gabriel Taubin and Daniel Moreno of Brown University. The course will begin by covering the mathematics of triangulation and taking a look at how camera calibration can convert image measurements to geometric quantities. The details of projector calibration will be explained, and a minimal post-processing pipeline is described to convert point-based representations to watertight meshes. Other topics include surface representations, file formats, data structures, polygonal meshes and basic gap-filling operations. It needn't feel overwhelming – although there's a lot to cover in this three-hour course, it's all backed up with examples, and a scanner with off-the-shelf parts will be used to demonstrate each new stage and concept. The future of DIY scanning is here!

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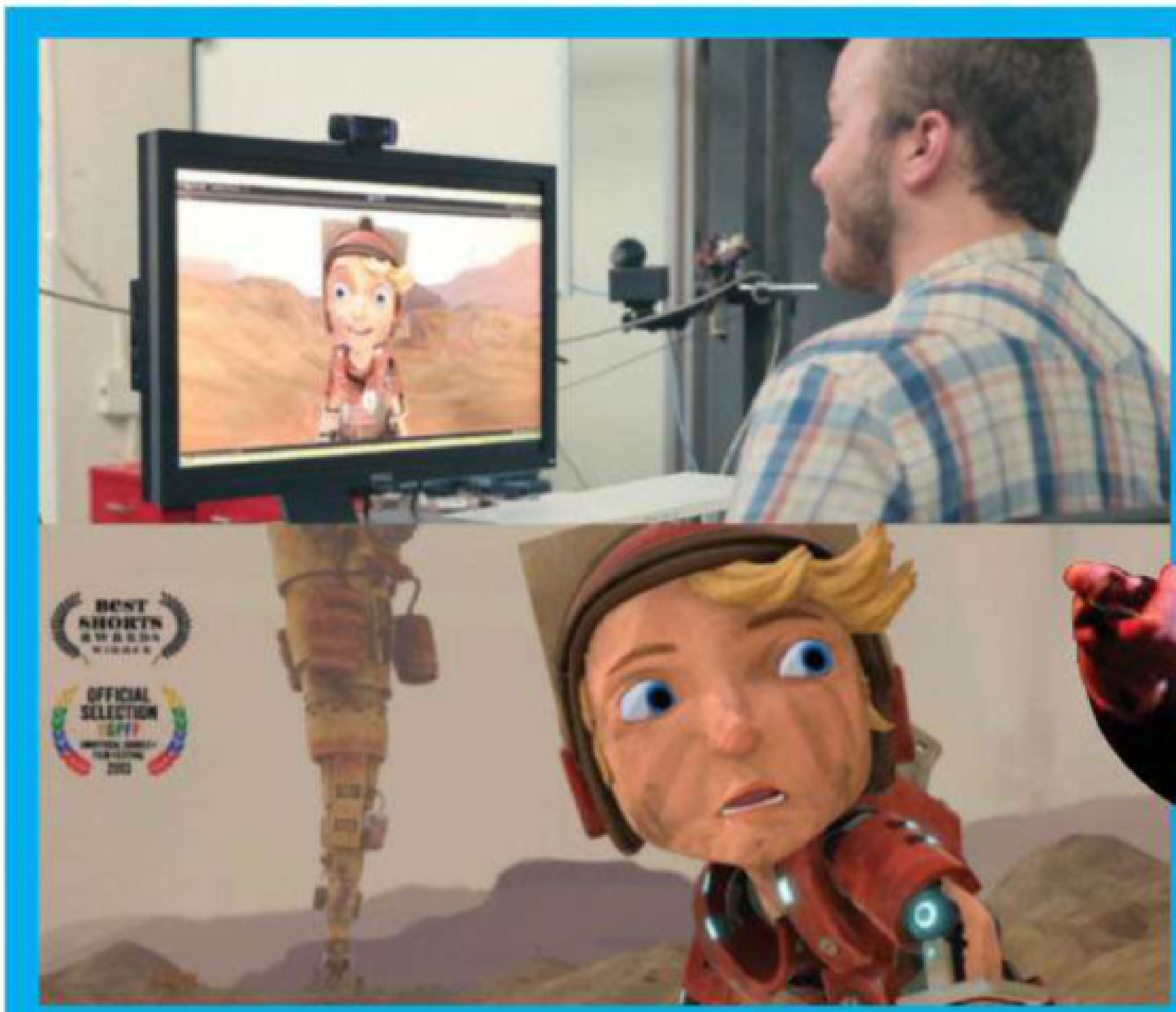
A selection of our Alumni's achievements, congratulations to them all.

NOT TO BE MISSED
at SIGGRAPH 2014

THE COMPUTER ANIMATION FESTIVAL

SIGGRAPH's Computer Animation Festival is simply unmissable, featuring an incredible array of both professional work and student productions. It's where you'll find the work of the creative superstars of tomorrow. The festival is recognised by the Academy Of Motion Picture Arts And Sciences as a qualifying competition, and several films first shown at SIGGRAPH have eventually gone home with the Oscar for Best Animated Short. There's a Best In Show Award, a Jury Award and Best Student Award to be handed out, but most people just like to take a break from the busy exhibition and slip into a darkened theatre for an hour or two and allow themselves to be transported to other worlds. 'Morphium' (pictured) is just one of the delights on offer.



REAL-TIME LIVE!

Real-Time Live! is always one of the most exciting and unpredictable events at SIGGRAPH. It's part of the Computer Animation Festival, but feels almost like a separate event. It showcases the latest trends, techniques and achievements in interactive visuals, all witnessed in a colourful and vibrant display of creativity. This year we know there will be an exploration of the destruction sequences in *Call Of Duty: Ghosts* and a Make Your Own Avatar session. There is also a Real-Time Animation Of Cartoon Character Faces section (as pictured) , in which a team from Mixamo will allow spectators to stand in front of a webcam and animate a 3D character in real time, using Mixamo Face Plus. As ever, if you want to see some really cool real-time innovations, be sure to check this out.

HOW TO TRAIN YOUR DRAGON 2

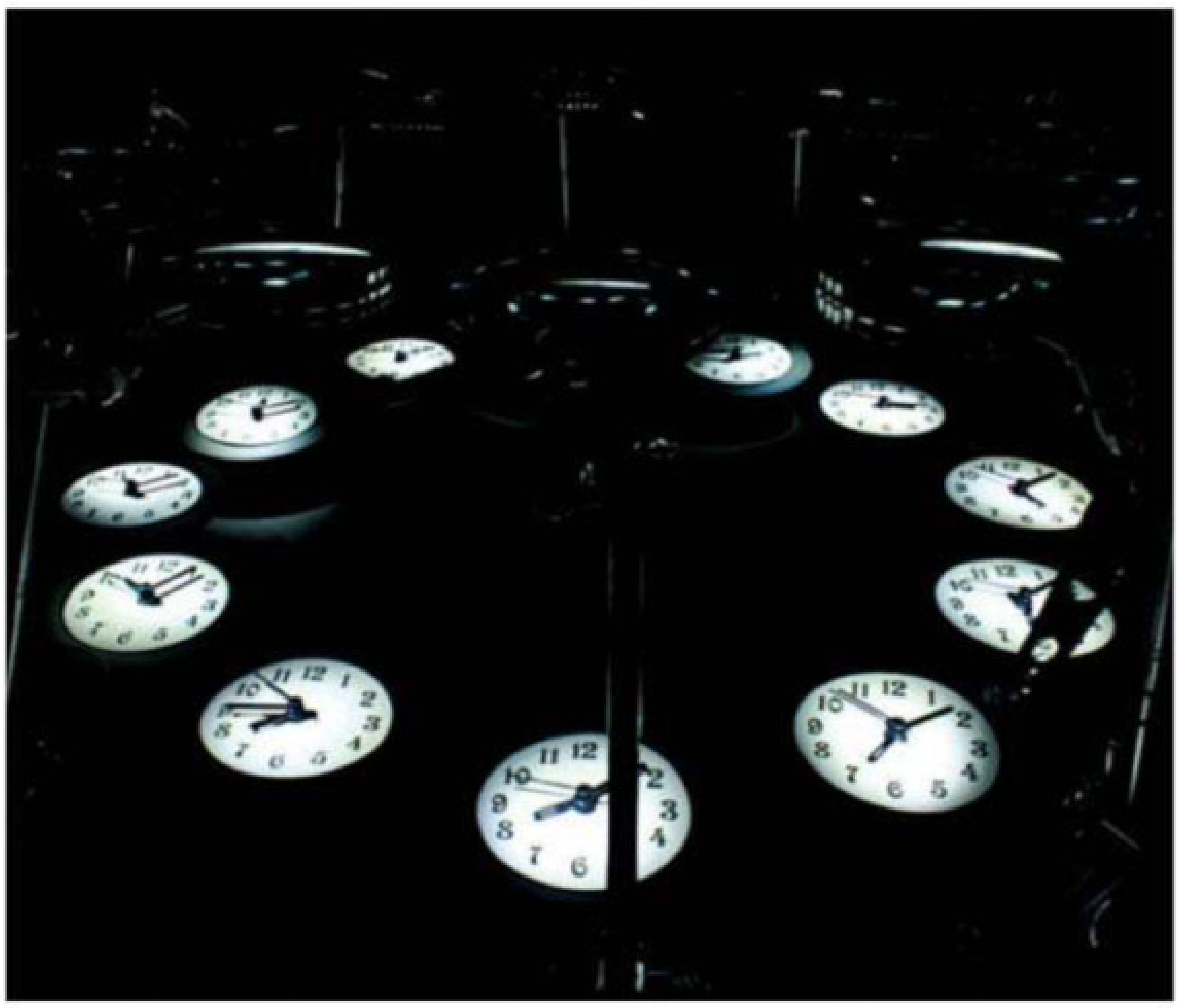
The joy of attending an event as huge as SIGGRAPH is being in such close proximity to people at the top of their game and getting to hear all about how they do what they do. This year there's going to be a panel and screening of DreamWorks Animation's *How To Train Your Dragon 2*, with writer/director Dean BeBlois, head of layout Gil Zimmerman, head of character animation Simon Otto and VFX supervisor Dave Walvoord on hand. The audience will find out all about the big creative challenges of the film, as well as the step forward the animators made in using Apollo, DreamWorks Animation's "ground-breaking next-generation animation system."

VIRTUAL REALITY COMP

Real-Time Live! has gained a reputation for being one of the most memorable parts of the SIGGRAPH line-up (see last year's Spontaneous Fantasia, pictured), but this year could be even more so, with a new Augmented Reality/Virtual Reality Contest. The idea of it was to encourage developers to create and show the best augmented/virtual reality experiences possible. Three finalists will be chosen to perform at Real-Time Live! and they can use any software or hardware they like. The beauty of it is that anyone can enter, so the setups on display might come from big companies, or they might come from students or hobbyists. It's a chance to see a different take on what's clearly going to be a big deal over the next few years.

THE EXHIBITION

Well, you can't miss the exhibition itself – it's too big and too noisy for that – but too many people attend SIGGRAPH without really getting the most out of exhibits. The world's biggest, best and most interesting hardware and software producers are there, and some of the world's greatest innovators. This is the perfect opportunity to try out their kit, bend their ear and just generally ask whatever question it is you've always wanted to ask. The key is not to be afraid to get stuck in, whether it's MAXON, NVIDIA, Oculus, Pixar or Wacom that you want to talk to (to name just a few of 2014's exhibitors). So get out there, get confident and go meet the people behind the tech!



THE ART GALLERY

Always well worth a wander around, SIGGRAPH's 2014's art gallery has adopted the theme of Acting In Translation. The result is a collection of incredibly diverse pieces, exploring global concerns and incredibly personal topics, each interpreting the topic in a multitude of different ways. As usual, there is a fantastic range of media on display, including 2D and 3D artwork, mixed-media installations, touch-screens, augmented reality, wearable art and much more. Pictured is a piece called *Looking Glass Time* from Yoichi Ochiai at the University of Tokyo, which represents social media and the artificial timeline it uses to show the real world.

ACM SIGGRAPH AWARDS

Of course, no event the size of SIGGRAPH would be complete without some awards, and the ACM SIGGRAPH Awards are worth taking note of. This year's winners include Noah Snavely from Cornell University (Significant New Researcher Award), Thomas Funkhouser from Princeton University (Computer Graphics Achievement Award), Harold Cohen from the University of California, San Diego (Distinguished Artist Award For Lifetime Achievement In Digital Art) and Scott Lang Bergen from County Academies (Outstanding Service Award). As well as the award ceremony, there's also the Award Talks, so you can find out what all these outstanding people are working on in their fields. There's also the ACM Student Research Competition, which if you're a student is a great way to find out what your peers are doing.

RECEPTION

Networking, socialising and the community are what SIGGRAPH was built on. It's a crucial way to meet your heroes and peers and to recharge your creative batteries. It all kicks off at the Monday evening reception, where you can meet and make new friends, all while browsing the art gallery, studio, and the Emerging Technologies exhibits. Don't think that's the end of it though. The Vancouver Convention Centre is a pretty big place, and being spread out means that every time you break into smaller groups – for a screening or a talk – there will be more opportunities to chat with people. And who knows, that person you offer a piece of gum to today might be your employer of tomorrow.

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MARI NUKE MODO THE FOUNDRY.

An introduction to

MODO, MARI AND NUKE WITH AMD

with Alberto Ezzy

If SIGGRAPH 2014 proves anything, it's that the future is well and truly here. Few cards prove that more than the AMD FirePro™ W9000 professional graphics card.

We wanted to see what could be achieved if we combined the power of the AMD FirePro™ W9000 graphics card with that of The Foundry's production-proven software packages MODO, MARI and NUKE. It's a combination capable of truly creating the art of the future.

To illustrate the point, we have put together three expansive nature scenes using MODO, MARI and NUKE, powered by AMD. Created by artist Alberto Ezzy, these landscapes are heavy in both polygon count and texture size. "I've tested other cards on similar scenes in the past, but they simply couldn't handle the vast amount of data required," says Ezzy. "The AMD FirePro™ W9000 does so very capably indeed".

To ensure a smooth user experience the AMD FirePro™ W9000 was installed in a Dell Precision T3600 workstation. "As you will see, all three scenes were very demanding in terms of assets," says Ezzy. "Nevertheless, thanks to Dell and the AMD FirePro™ W9000 graphics card I was able to achieve the results I was after."

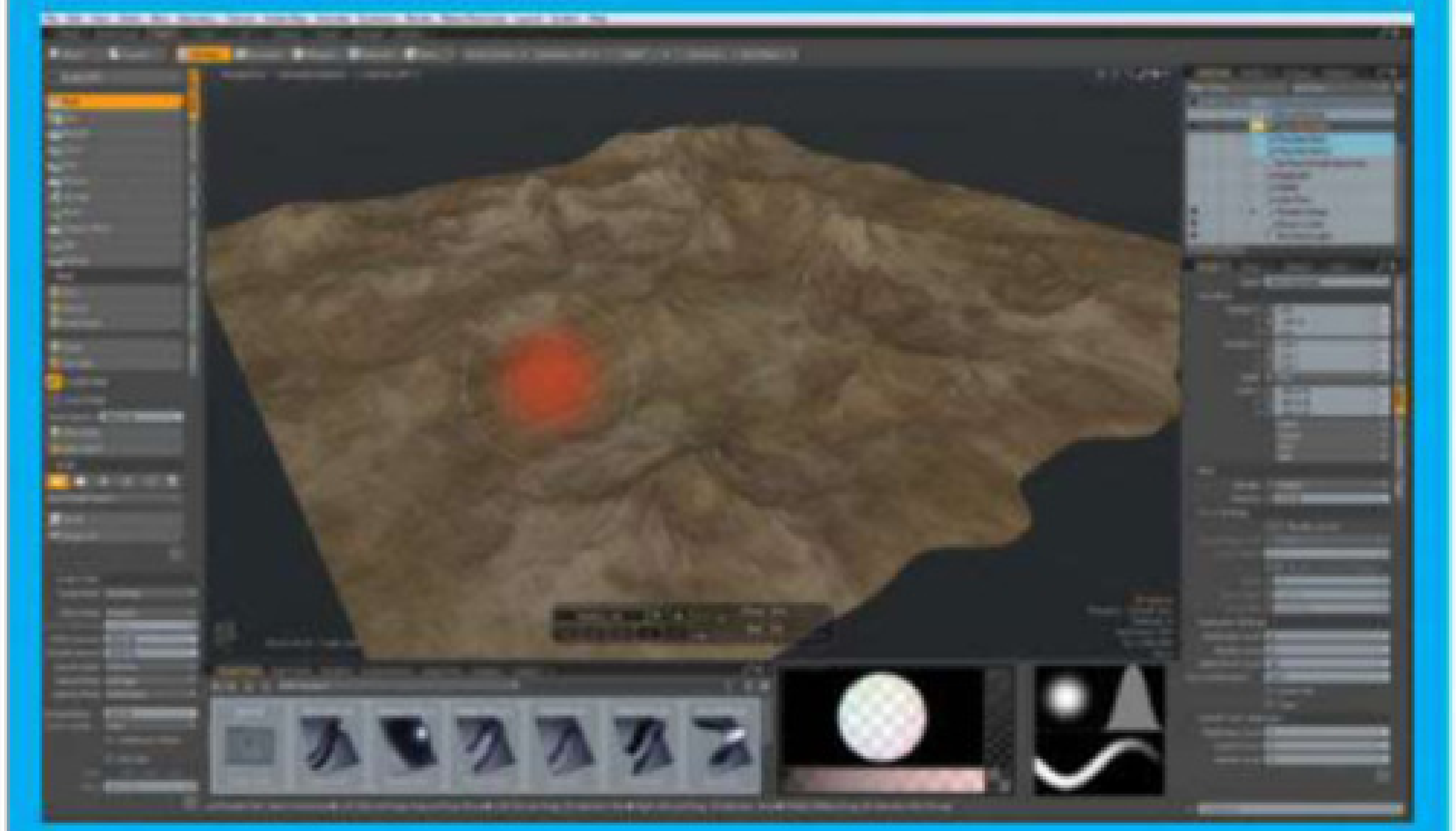
Over the next pages Ezzy reveals how he utilised MODO, MARI and NUKE, along with AMD technology, to achieve his stunning renders.

INTRODUCING THE NEXT-GENERATION OF WORKSTATION GRAPHICS

Although this project was carried out with an AMD FirePro™ W9000 graphics card, this year we see the release of the next generation of AMD FirePro™ professional graphics family starting with the AMD FirePro™ W9000 successor, the AMD FirePro™ W9100 graphics card. With this release you can work at a whole new level of detail, speed, responsiveness and creativity with supercomputing-class performance at your fingertips. Tackle the most complex modelling and simulation projects with 16GB of GDDR5 dedicated memory and 5.24 TFLOPS single precision performance and fly through edits, filters and colour corrections, or process multiple effects entirely in real-time and in 4K resolution.

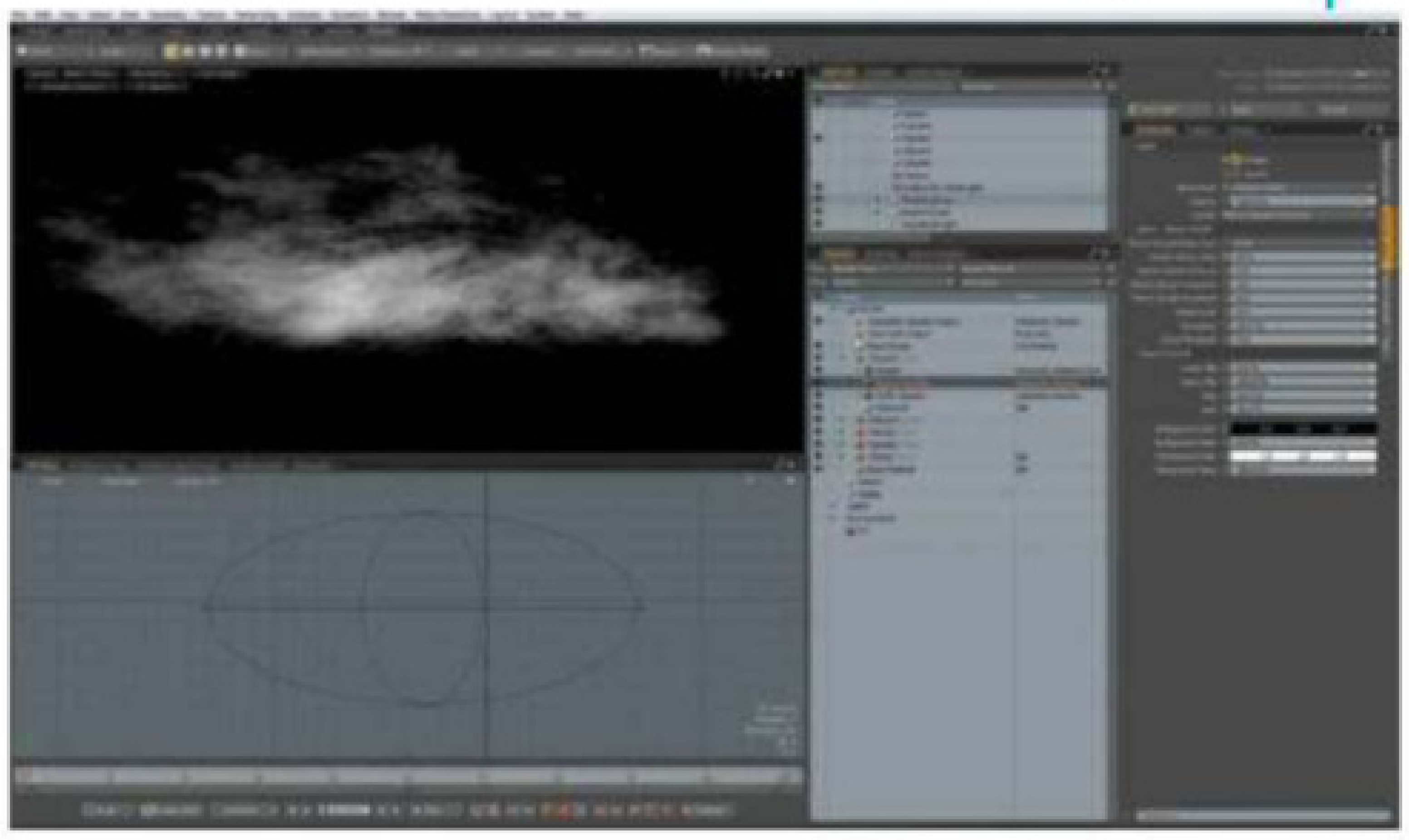
Using MODO

We see what's possible when end-to-end software meets the power of AMD technology



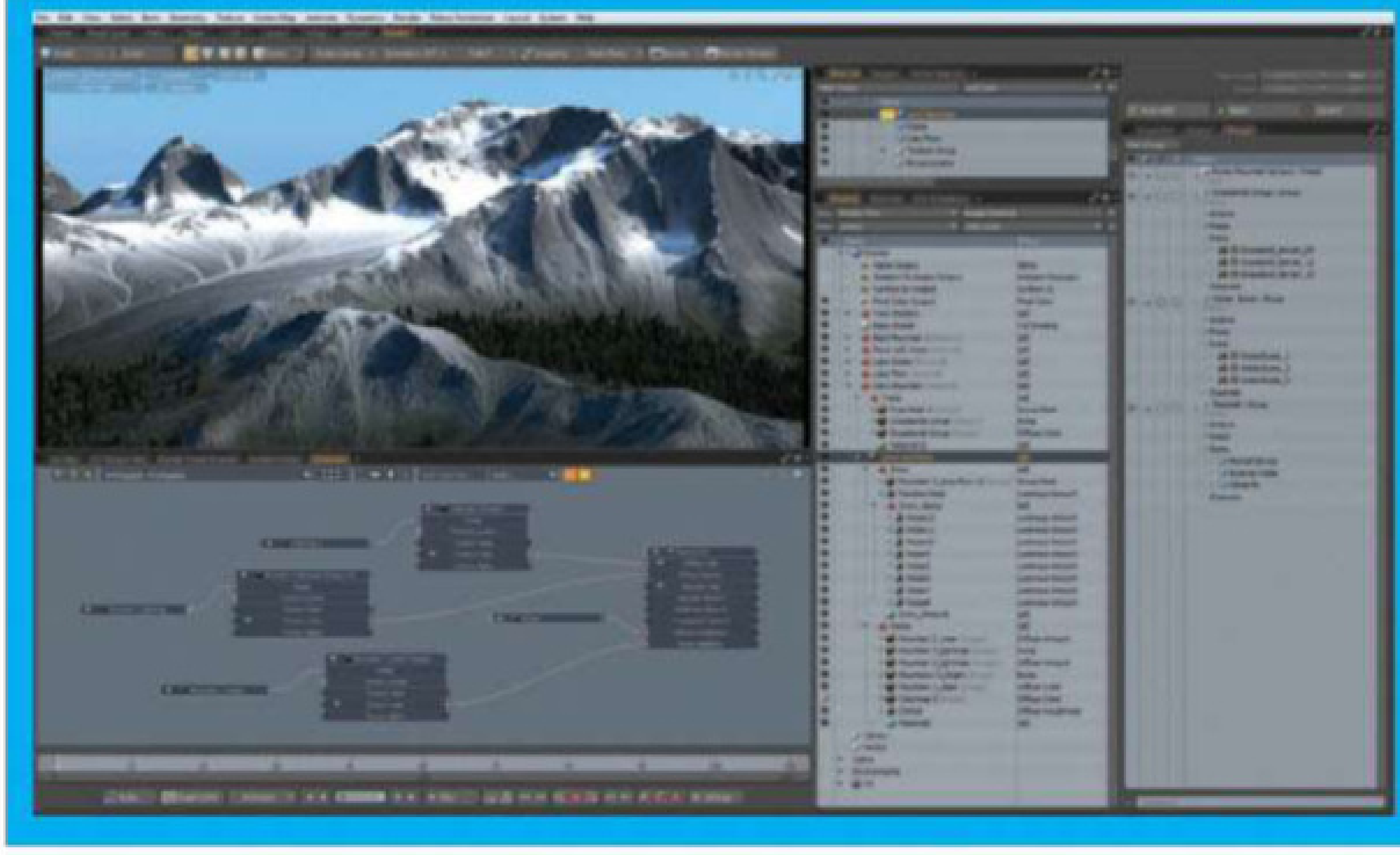
MOVE MOUNTAINS

The mountains were textured using 16-bit Displacement maps in MODO. A great feature in MODO is Convert To Multiresolution, which is found under the Paint Utilities tab. This converts your mesh so you can further sculpt and refine it. The Displacement map is then no longer needed, but I usually apply it as a Bump map as it gives extra detail to the terrain. Thanks to the AMD FirePro™ W9000's large dedicated memory (6GB), I could load lots of textures and detail while still experiencing a smooth and responsive workflow. I didn't need to worry about slowdown at all.



USE VOLUMES

Volumes in MODO are great for creating elements such as clouds. By assigning an Item Mask to the Volume, you can texture them. I chose Planet Clouds and Puffy Clouds layers set to Volume Density. You can create different types of clouds by experimenting with the Layers and Volume settings. Even greater variety can be achieved by adding a Noise layer and setting its effect to Texture Offset. The clouds can then be rendered with the scene in MODO, or, if you wish, you can combine them later in post in NUKE, as it offers an incredible amount of control and depth, especially when used in tandem with AMD technology.

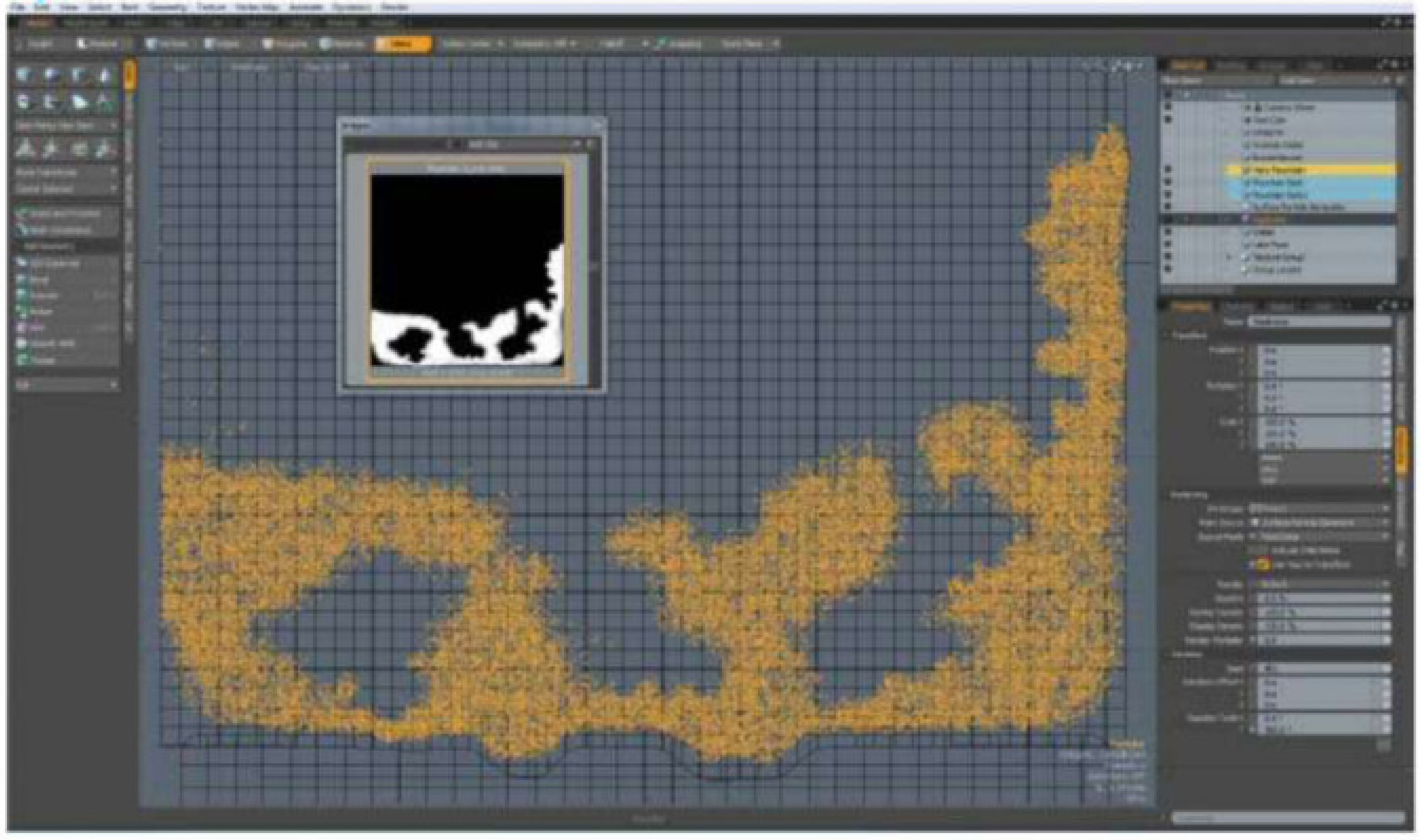


NODAL SHADING

The Shader Tree offers a very intuitive way of applying textures to your 3D objects. For the mountains, I created rock and snow materials, placed them inside groups and then used an Image map as a Group Mask to control the overall level of snow coverage.

An alternative workflow to using the Shader Tree is that of Nodal Shading. Nodal Shading is one of the great new features found in the latest version of MODO. It enables you to create and visualise complex material setups that really help to sell your scene. You can use one or the another, or a combination of both. The choice is yours. With the AMD FirePro™ W9000's large amount of GPU cores (2048) powering my workflow, I ended up with some fantastic results.

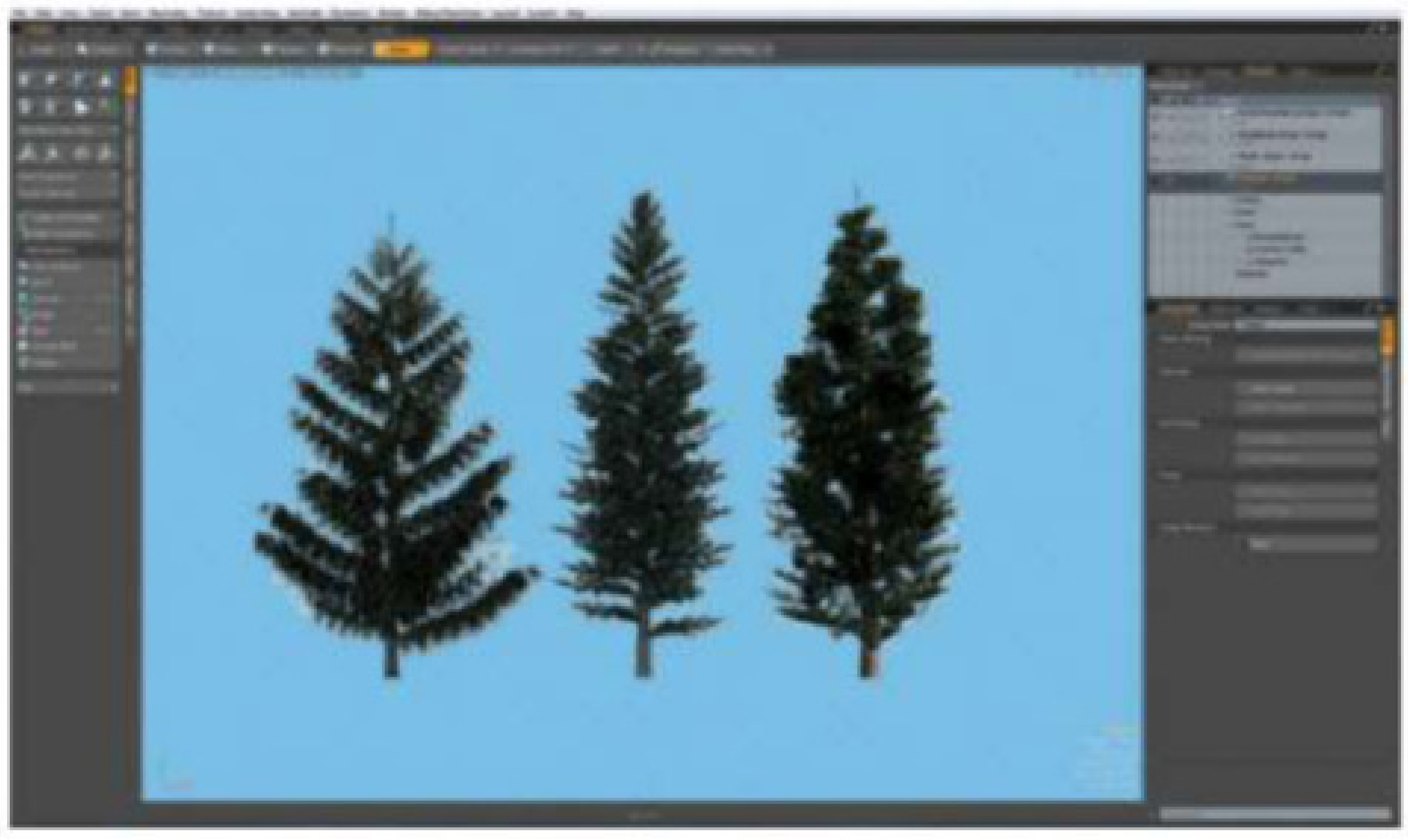
Image courtesy of ALBERTO EZZY cgi



MODO REPLICATORS

One of the greatest additions to MODO over the years is that of the powerful Replicators function. Replicators offer a great way of duplicating and scattering large amounts of objects at render time. They gives users the ability to render literally billions of polygons, populating a scene in a quick, easy and reliable fashion. This is especially true if you have hardware such as an AMD FirePro™ W9000 powering the scene.

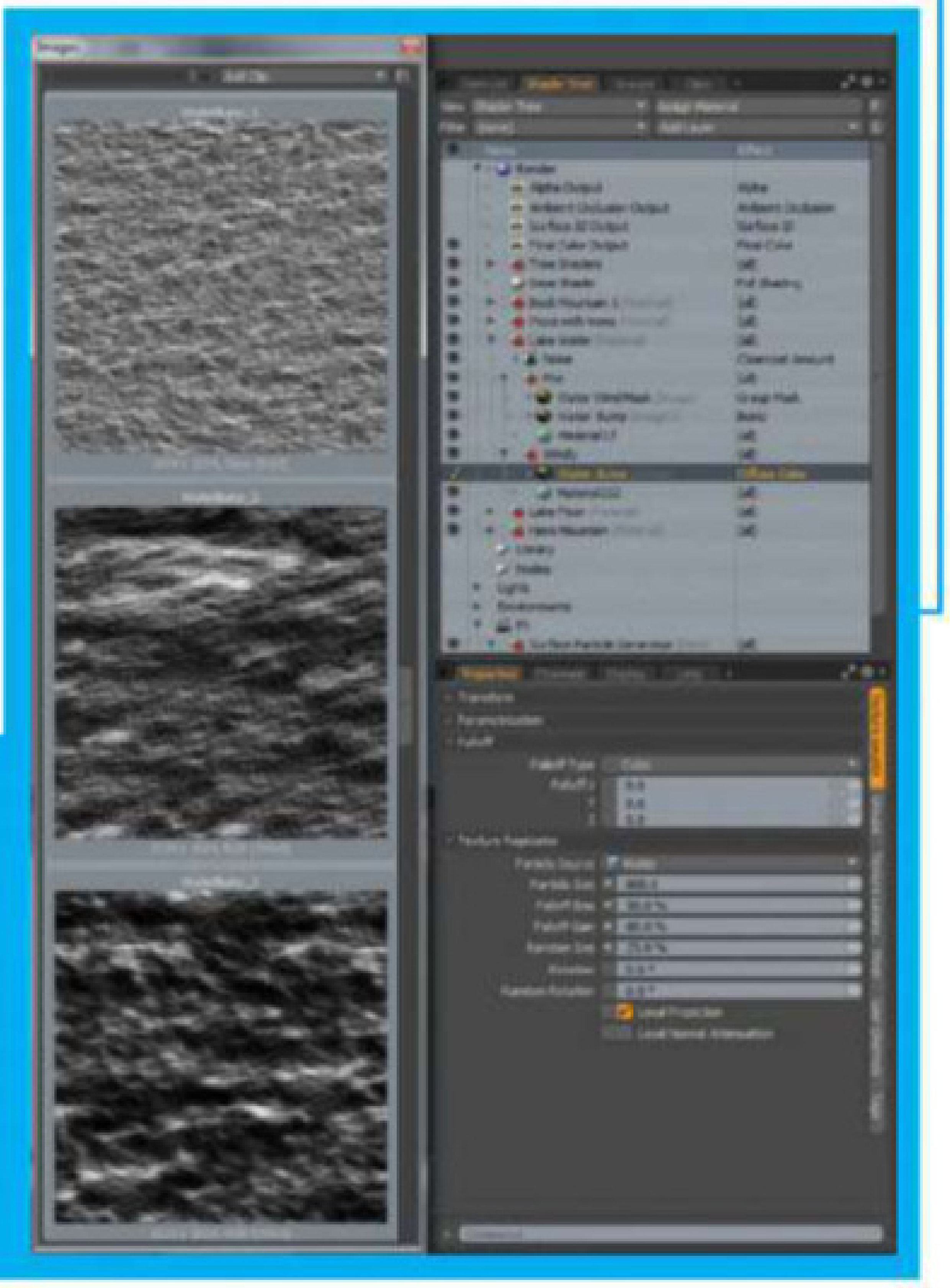
When creating areas of forest, you want to avoid a visible pattern, as it feels unnatural. To do this, use the Surface Particle Generator combined with a painted map. This offers control over the random placement and density of the replicated objects.



These trees were modelled, grouped and then replicated across the scene. The scene was densely populated, but easy to manage

WATER SURFACES

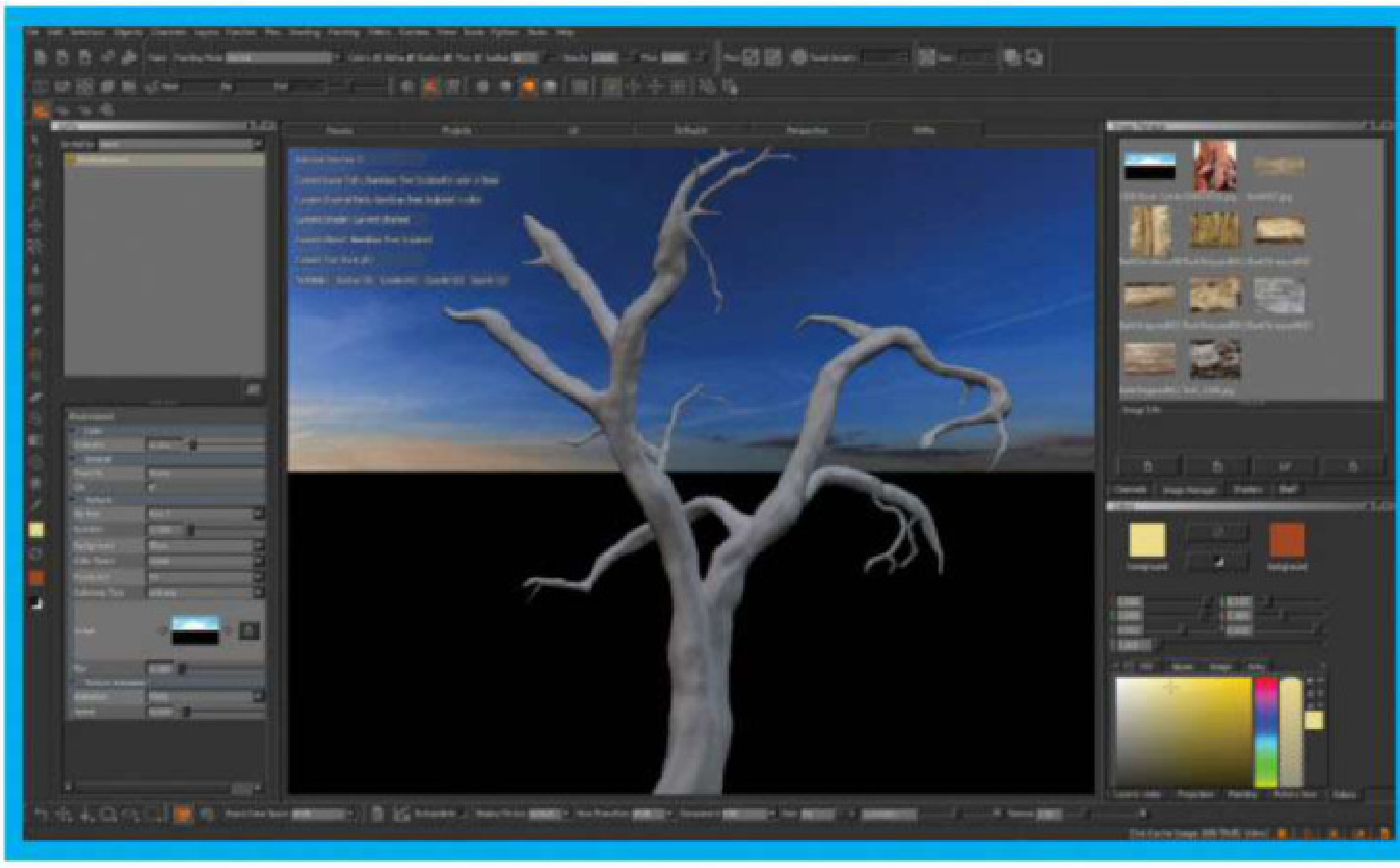
Great texture variation can be achieved by using Texture Replicators, which is also known as Texture Bombing. This can be used as a really quick and simple process for water creation. Here I used three different grayscale Image maps of rippled water surfaces for Bump mapping and placed them into a group. MODO then randomly picked whatever was in that group to create textures without visible tiling. You can set values like Size, Rotation, Falloffs and Randomness to your liking. In the Shader Tree I created a flat water surface and a rippled water surface. Next I painted a Distribution map and used it as a group mask to create the pattern of wind gusts on the lake water.



ADVERTORIAL

Texture in MARI

Master high-resolution texturing on an epic scale with AMD and MARI

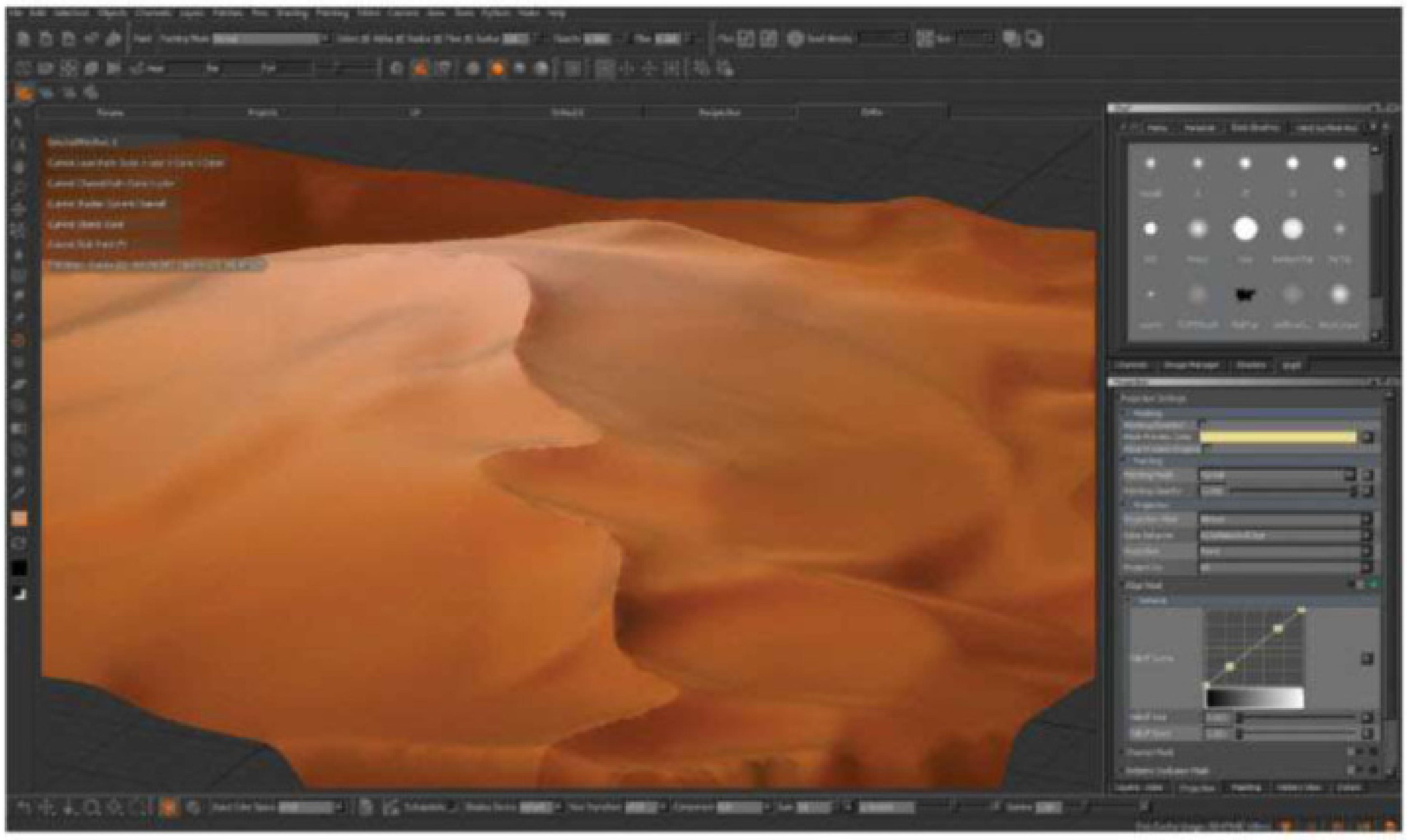


PAINT LANDSCAPES

I chose to do texture painting in MARI, The Foundry's production-proven 3D painting tool.

With MARI you can truly breathe life into your scenes. Colours can be painted with a vast choice of brushes, or you can also use photo reference with the Paint Through tool, as I did with the tree on the left. There is also a great set of procedurals at your disposal.

Of course, a powerful graphics card is very important. The AMD FirePro™ W9000 was perfectly suited to getting the job done. Its large, dedicated memory and generous memory bandwidth (264 GB/s) via the PCI 3.0 allowed for a great user experience.



TEXTURE WITH EASE

One of the great features in the latest version of MARI is that you can now import an HDRI as your light source. Here I took the same HDRI that is lighting my scene in MODO and imported it into MARI. This way I could achieve the same mood, look and feel for the overall scene with ease.

You can also stack layers on top of each other, create groups, add adjustment layers and more. MARI's workflow will be familiar to anyone accustomed to applications such as Photoshop. It's all incredibly intuitive.

Thanks to the AMD FirePro™ W9000, it's a breeze to paint high-res textures in MARI. I used as many tools as possible to create this image and it all felt very fluid, with no stopping and starting whatsoever.

Image courtesy of ALBERTO EZZY cgi

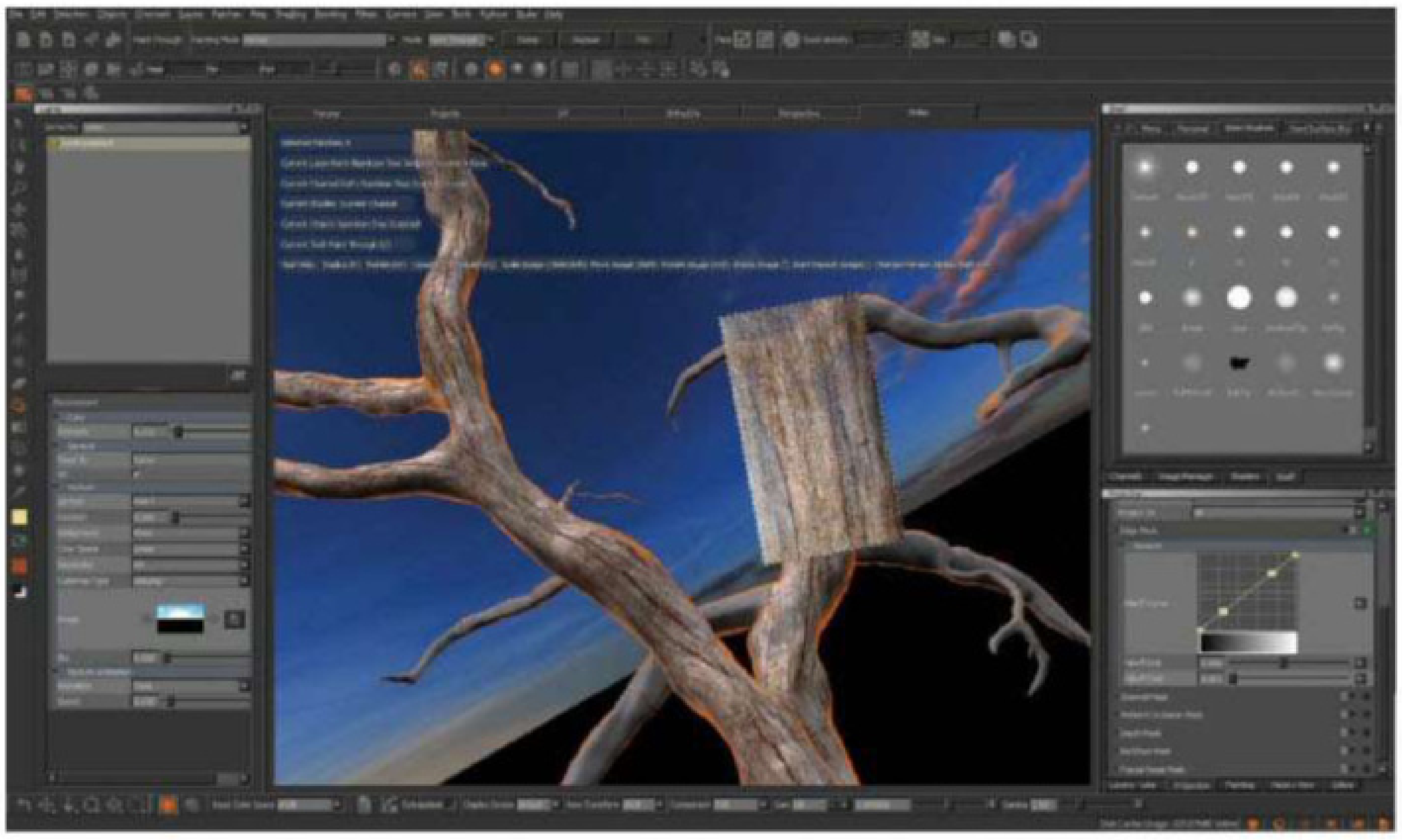
CREATE MAPS

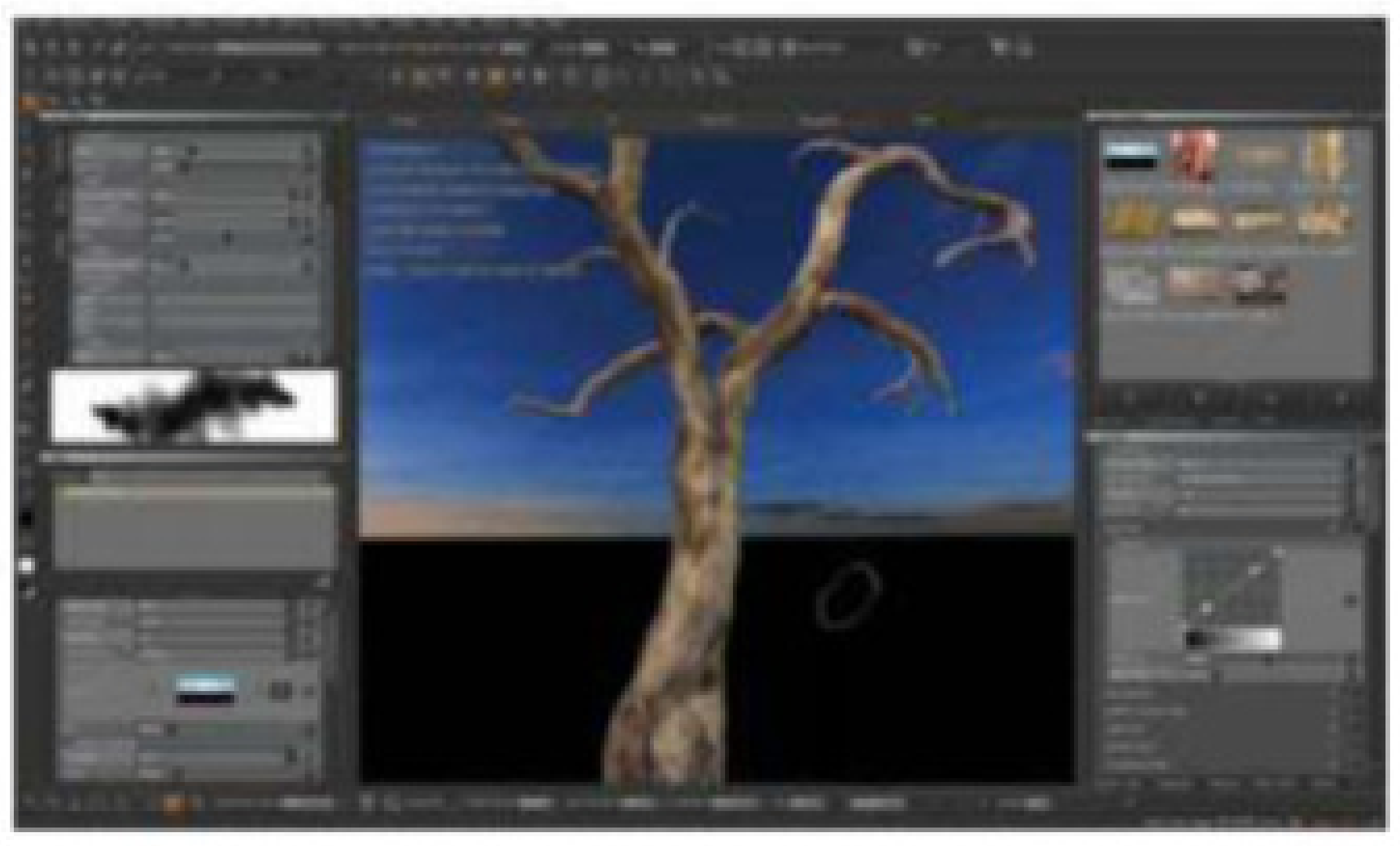
As with any 3D project, good reference is key, so spending time searching for quality, high-resolution photographs is paramount. Even better, take as many digital shots as you can yourself. It feels very rewarding when you apply them in MARI and see your 3D object come to life.

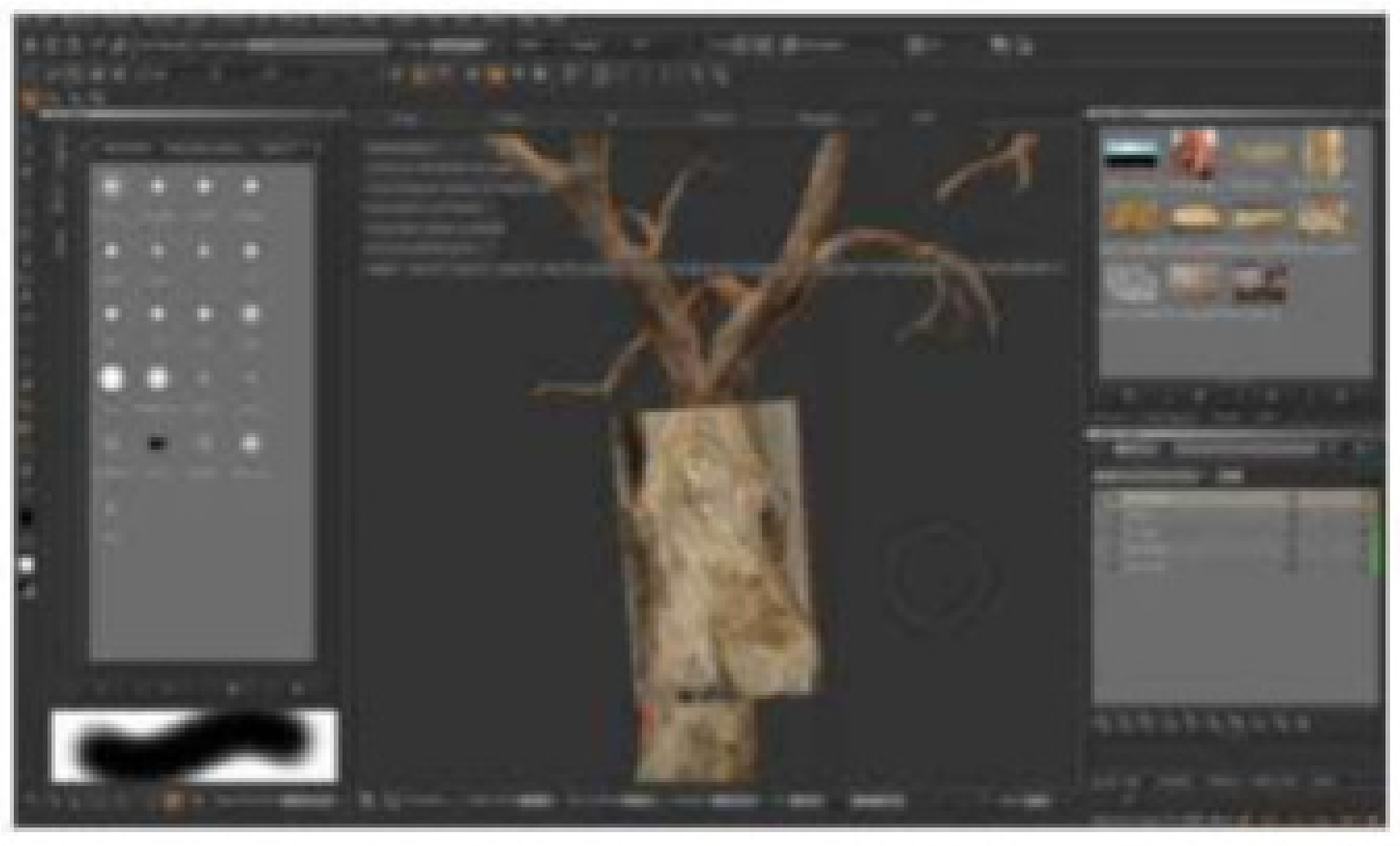
Of course, it doesn't end with painting your Color or Diffuse maps. The list of maps you can and should create can be long indeed. For this tree I painted Bump, Displacement, Dirt and Cavity maps.

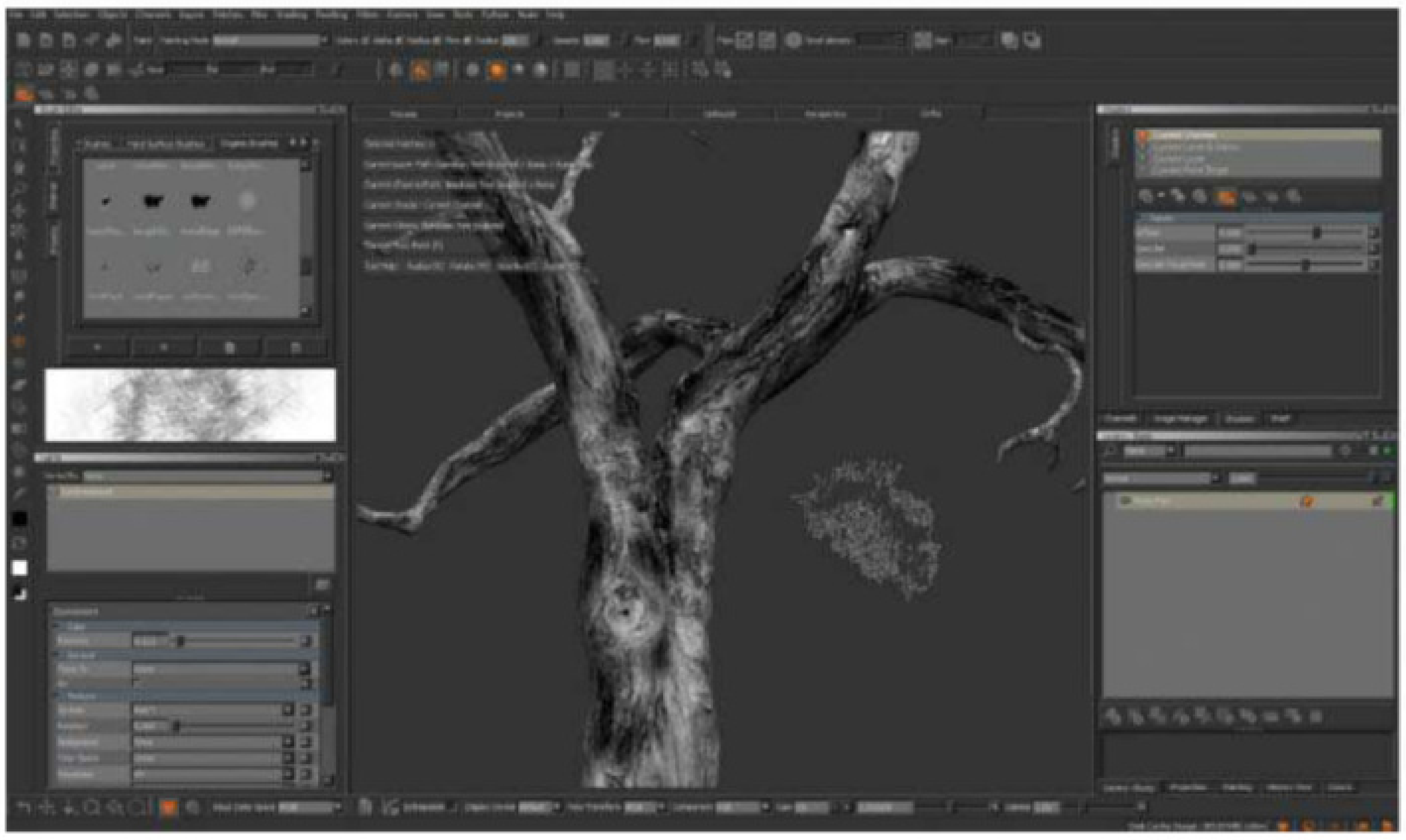
You could also paint Specular, Reflection and Roughness maps for metallic objects, or different Dermal maps for skin.

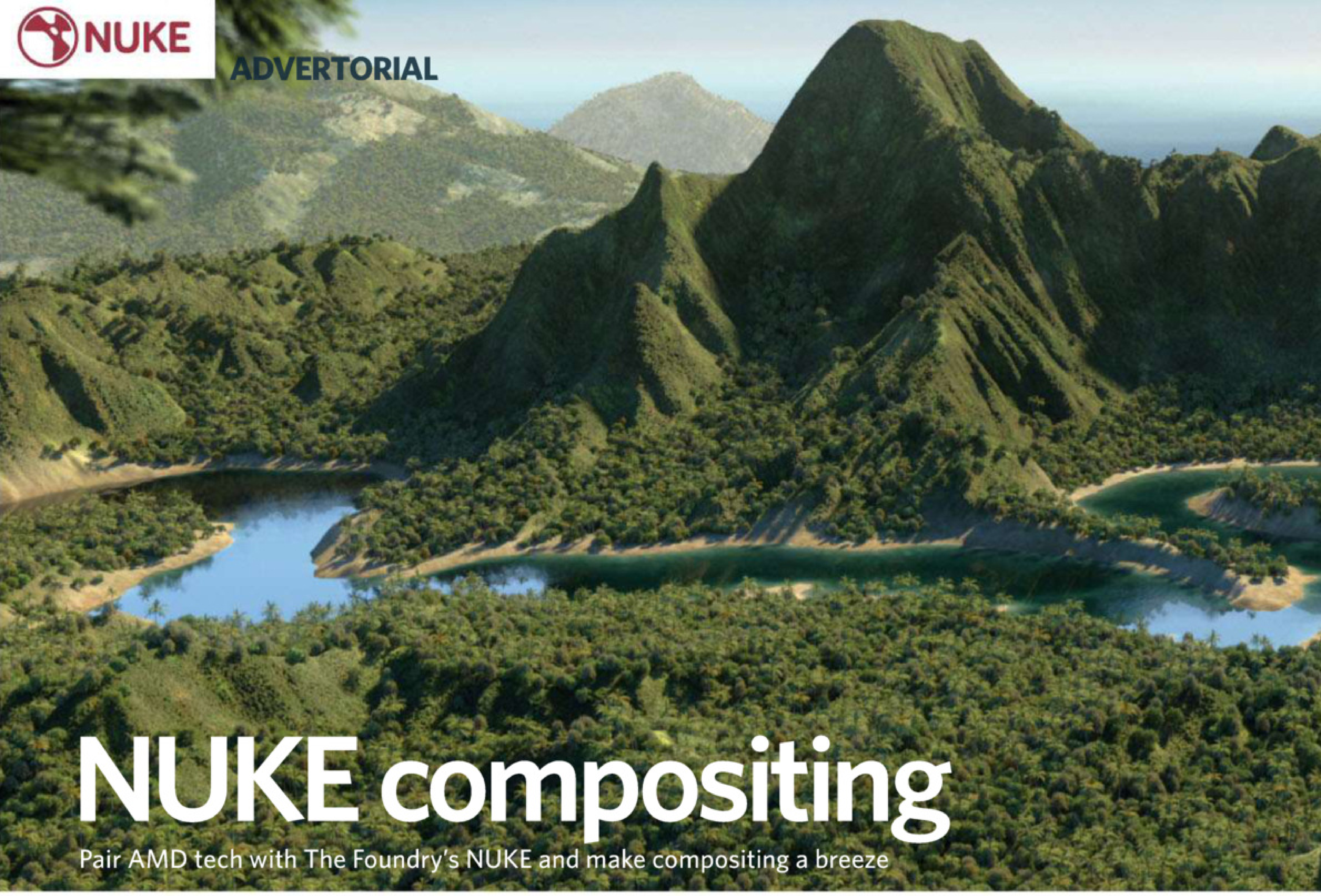
Either way, MARI is a state-of-the-art digital painting tool with great control over numerous UV tiles per object – a feature that is also seamlessly integrated in the latest release of MODO.





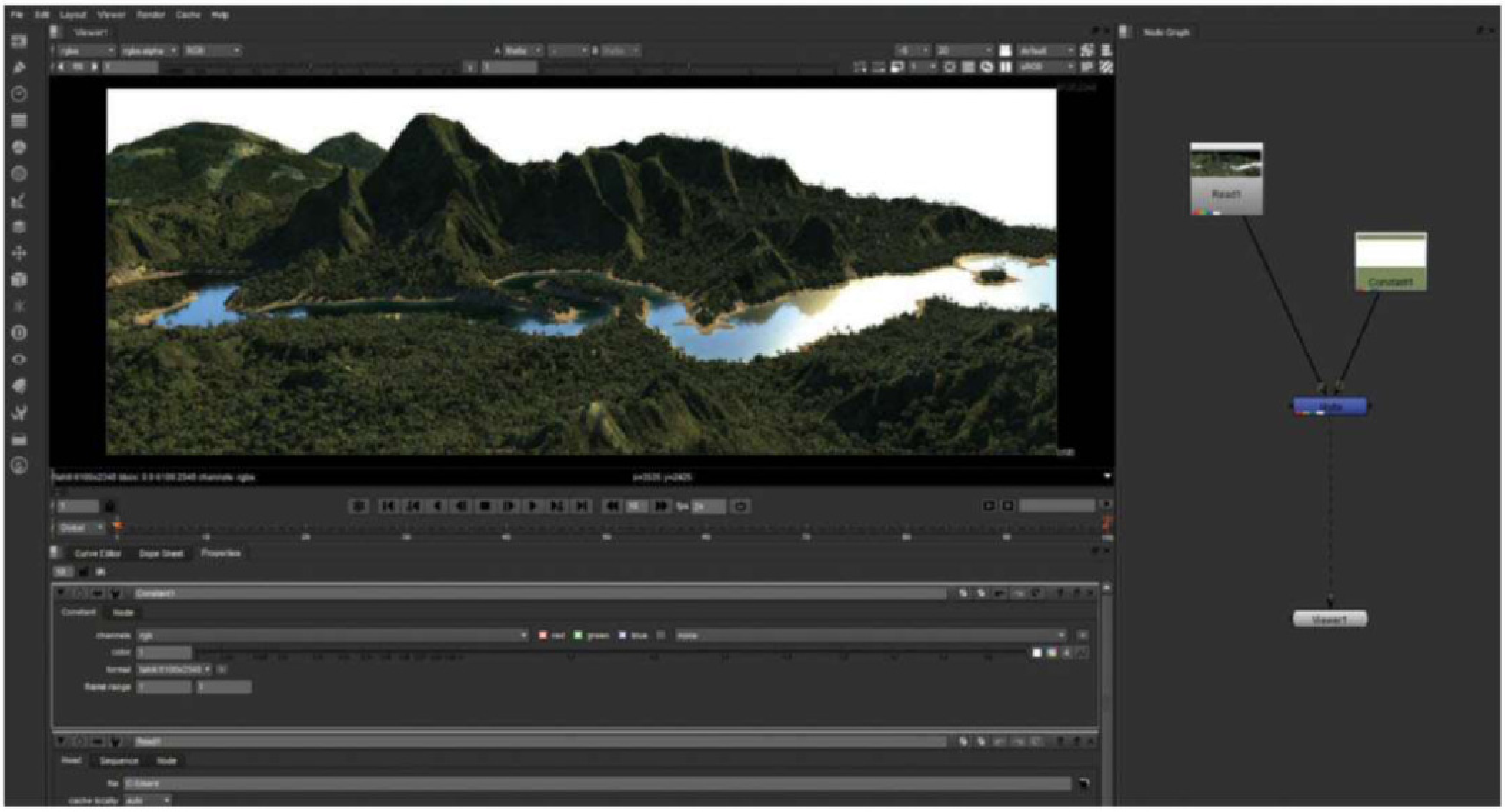






NUKE compositing

Pair AMD tech with The Foundry's NUKE and make compositing a breeze



THE POWER OF NUKE

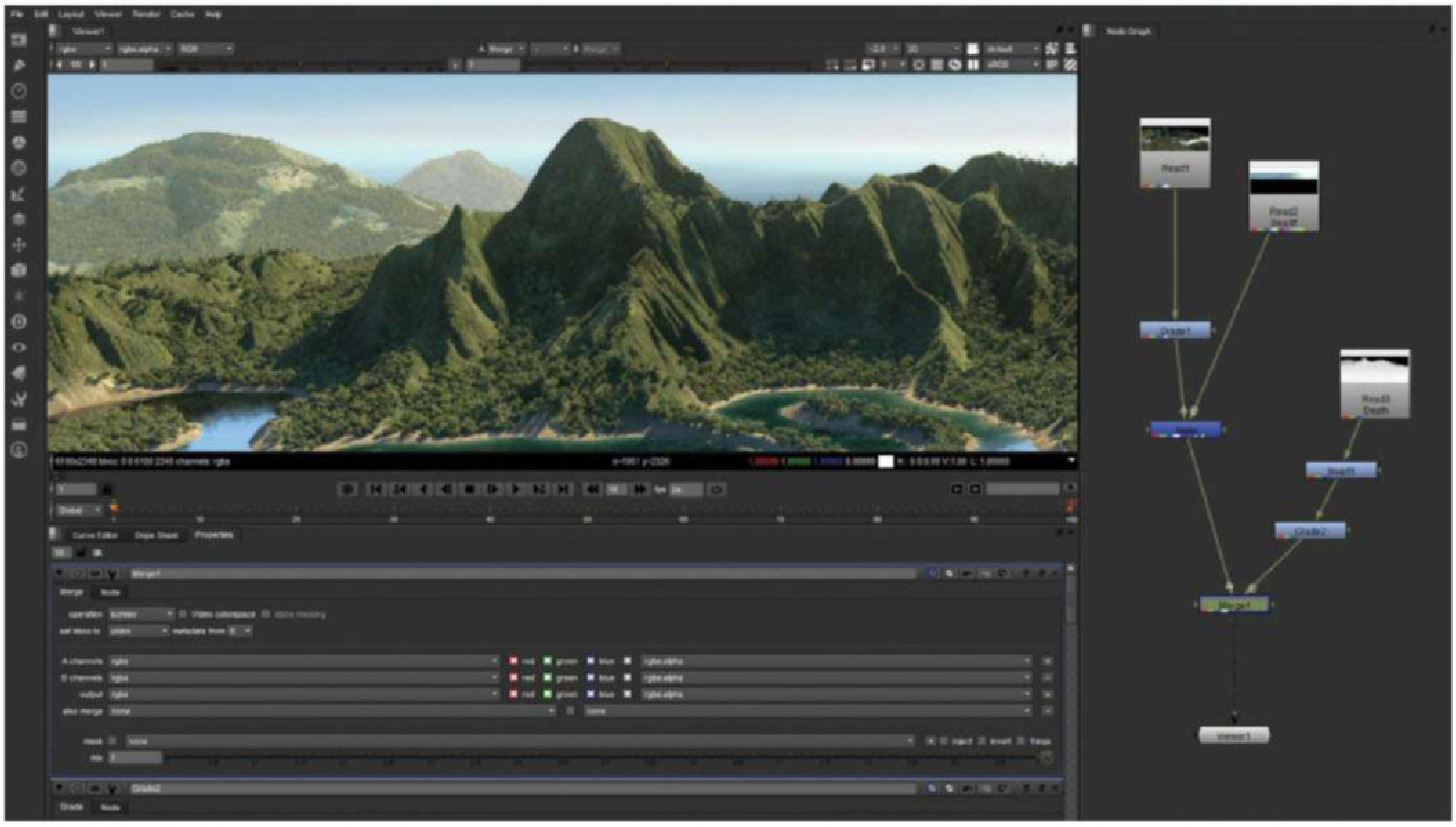
NUKE is a fantastic node-based compositing software, and today it's more or less the industry standard. However, it often has to perform very intensive calculations, particularly in VFX-heavy productions. As such, it helps to have powerful hardware behind the scenes.

Enter the AMD FirePro™ W9000. This graphics card is an ideal choice for working in NUKE and ensures a very smooth compositing experience. Even when working with memory-heavy scenes, such as the one above, you won't find yourself hitting any brick walls.

In the scene above I used real-world elevation data to create the Displacement map for the terrain. Five tropical trees make up the vegetation, with Replicators with different Surface Particle Generators driving their placement, and painted Distribution maps driving the Surface Particle Generators.

I merged these separate elements together and completed colour grading using NUKE. The workflow was extremely fast, efficient and intuitive, making my job far easier overall.

Image courtesy of ALBERTO EZZY cgi



POST-PRODUCTION

I used the Grade node in NUKE a great deal for this scene. With it you can adjust elements such as Gamma, Lift, Gain, the black and white point, and so on. I added more brightness and contrast to the render by changing the Lift, Gain and Multiply values.

The Depth Render Output from MODO was used to create depth in the composition. First I inverted it with an Invert node and merged it with a Screen Operation in the Merge node. The foreground foliage was then added with a Matte Operation inside the next Merge node. I used the Matte node to add the sea background.

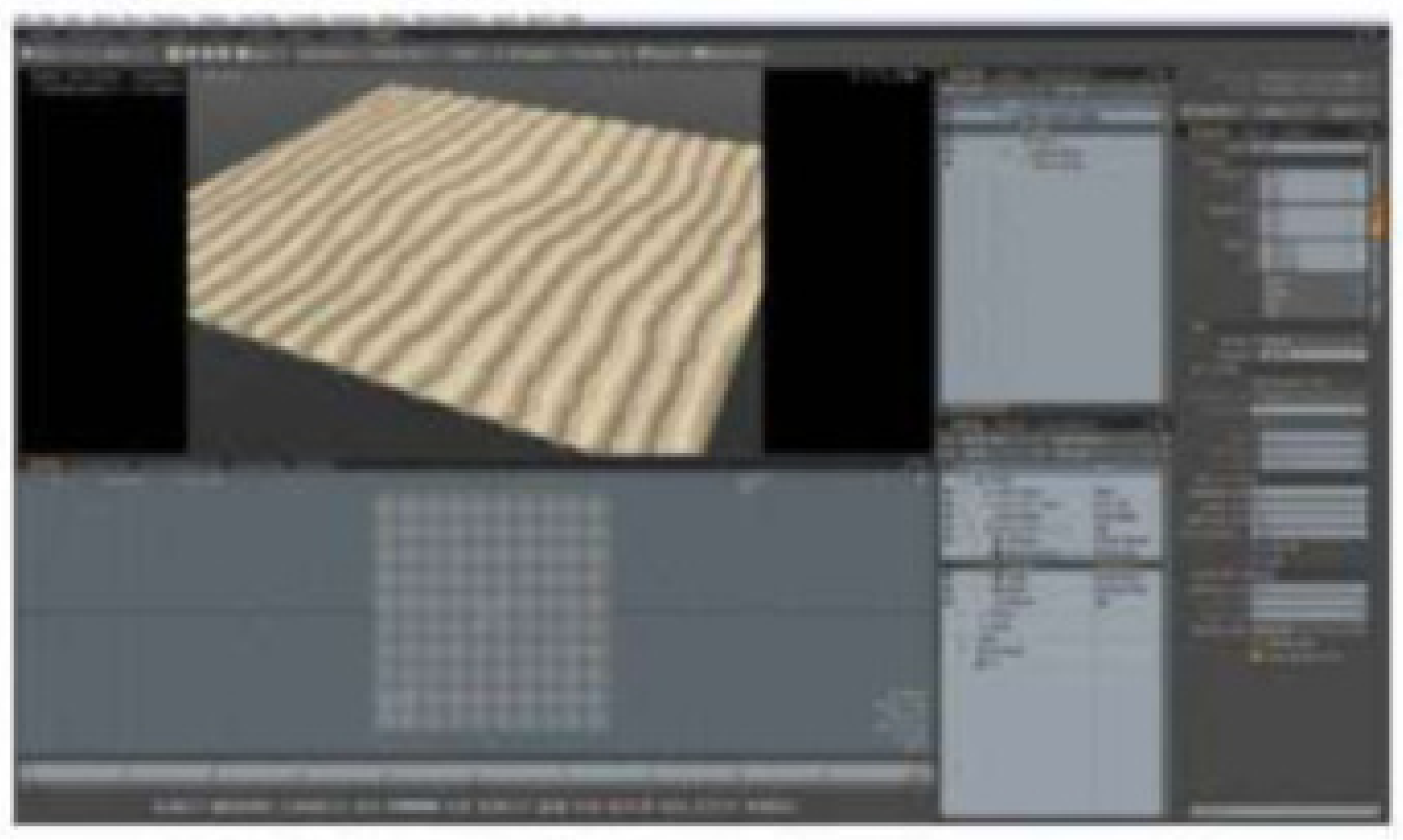
All this of this was accomplished with 32-bit floating-point precision at 6,000px resolution, with very little slowdown or any other problems encountered, thanks to AMD tech.

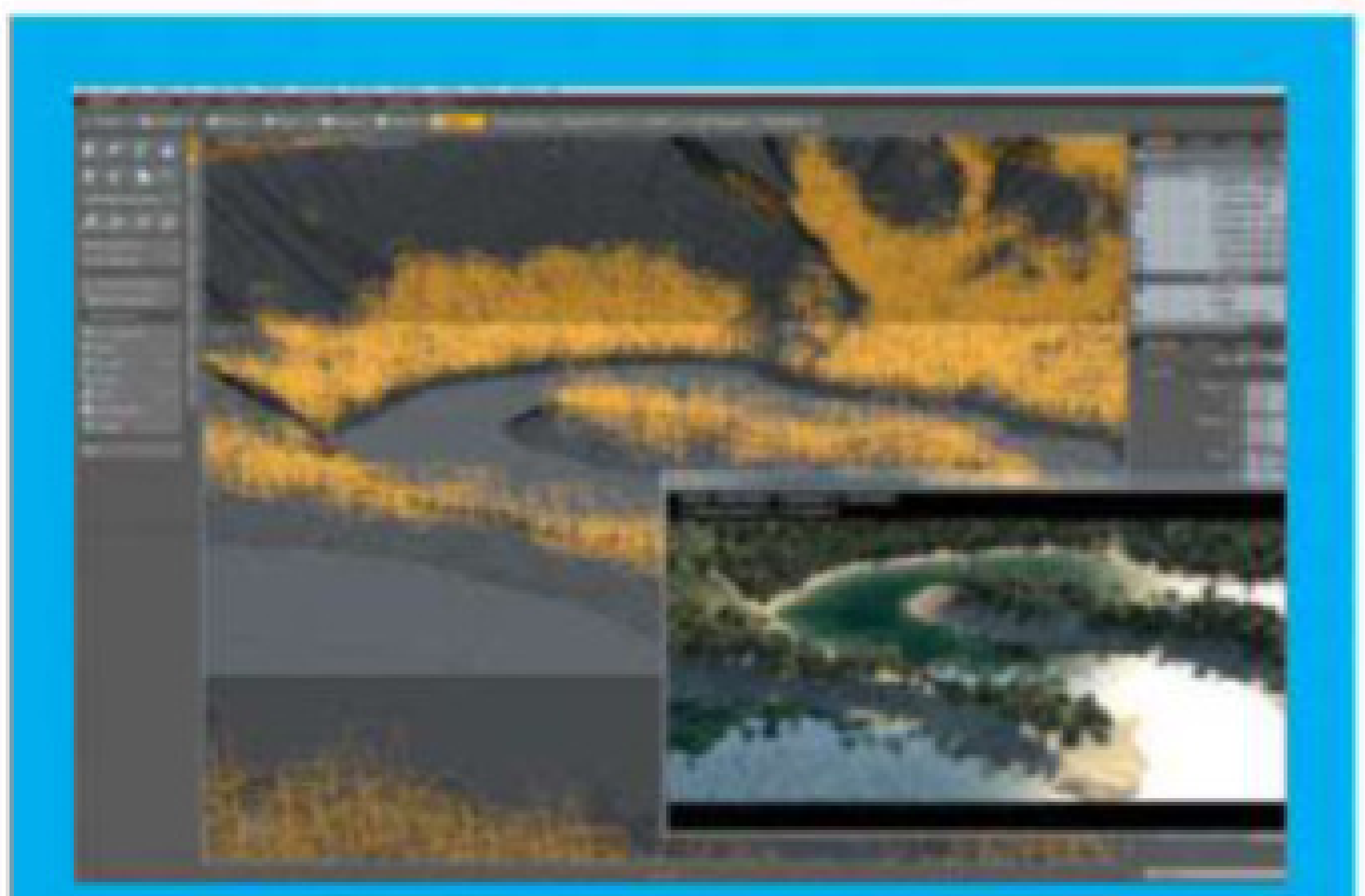
Tips and tricks

Some final notes to help improve your future work

GAUSSIAN WAVEFORM LAYER

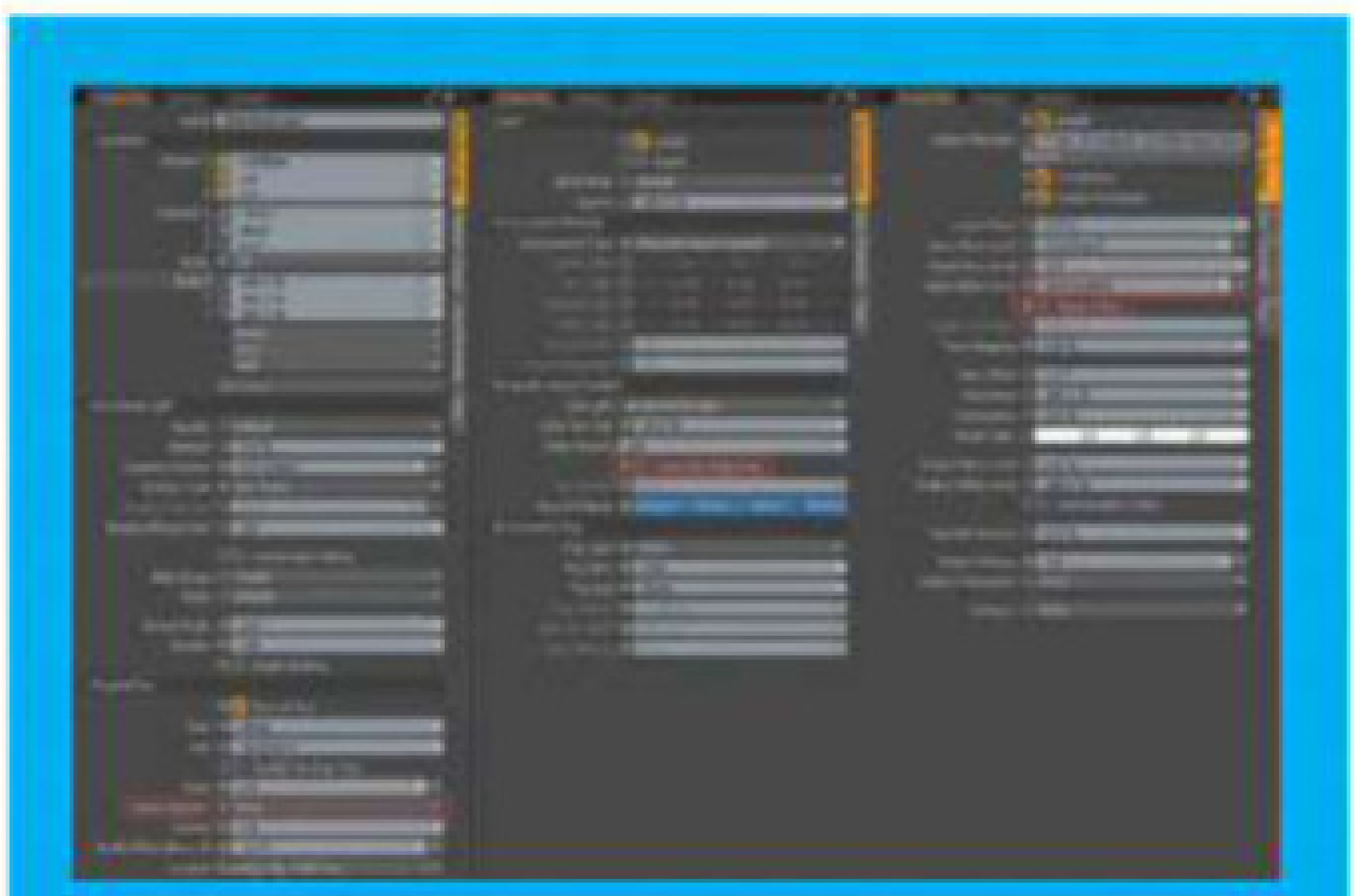
If you're using a Procedural texture but find it too sharp, you can blur it with a Gaussian Waveform layer in MODO. Make sure you position this layer directly above the Procedural layer and set its Effect to the same setting. I used this technique to make the ripples in the dune sand in my desert image. I used a Strata procedural with a Noise Texture Offset for randomness and a Gaussian Waveform to blur the sharp Strata edges. Both layers were set to Displacement.





MODO PREVIEW RENDERER

MODO's Preview Renderer is so powerful that you don't have to consider rendering as the last step in your 3D workflow anymore: it can now be part of any 3D task. Just open your Preview Render Window as an extra palette and you can see immediate updates of any change you make in modelling, retopology, painting, texturing and more.



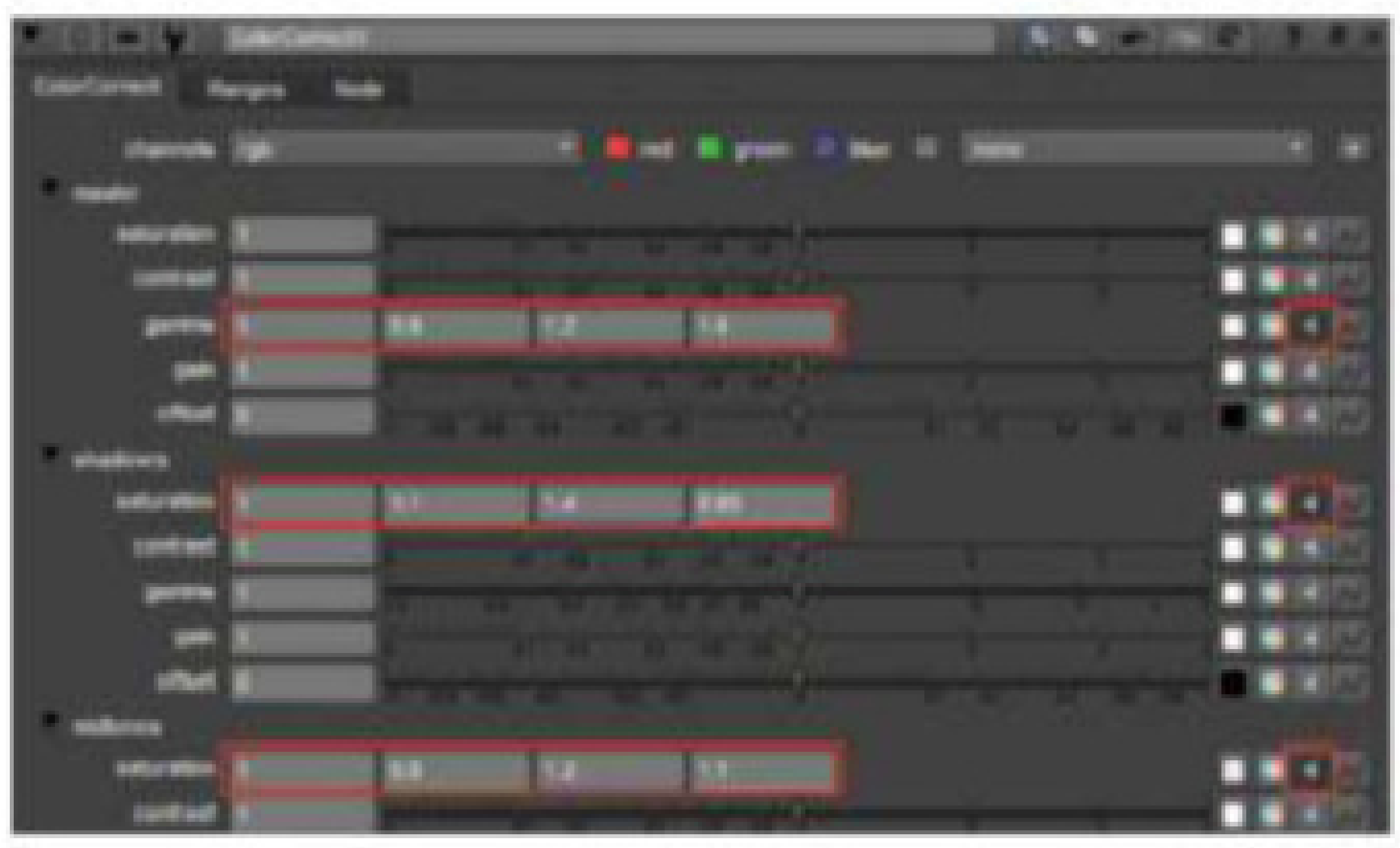
TURN OFF CLAMPING

I prefer my MODO renders with Clamping set to Off. Without Clamping you get a deeper, richer render. There are a few places where you can toggle Clamping On or Off.

You also need to adjust the Input White Level in the Final Color Output settings, similar to traditional photography, otherwise your render will look washed out or overexposed.

PER-CHANNEL CORRECTIONS

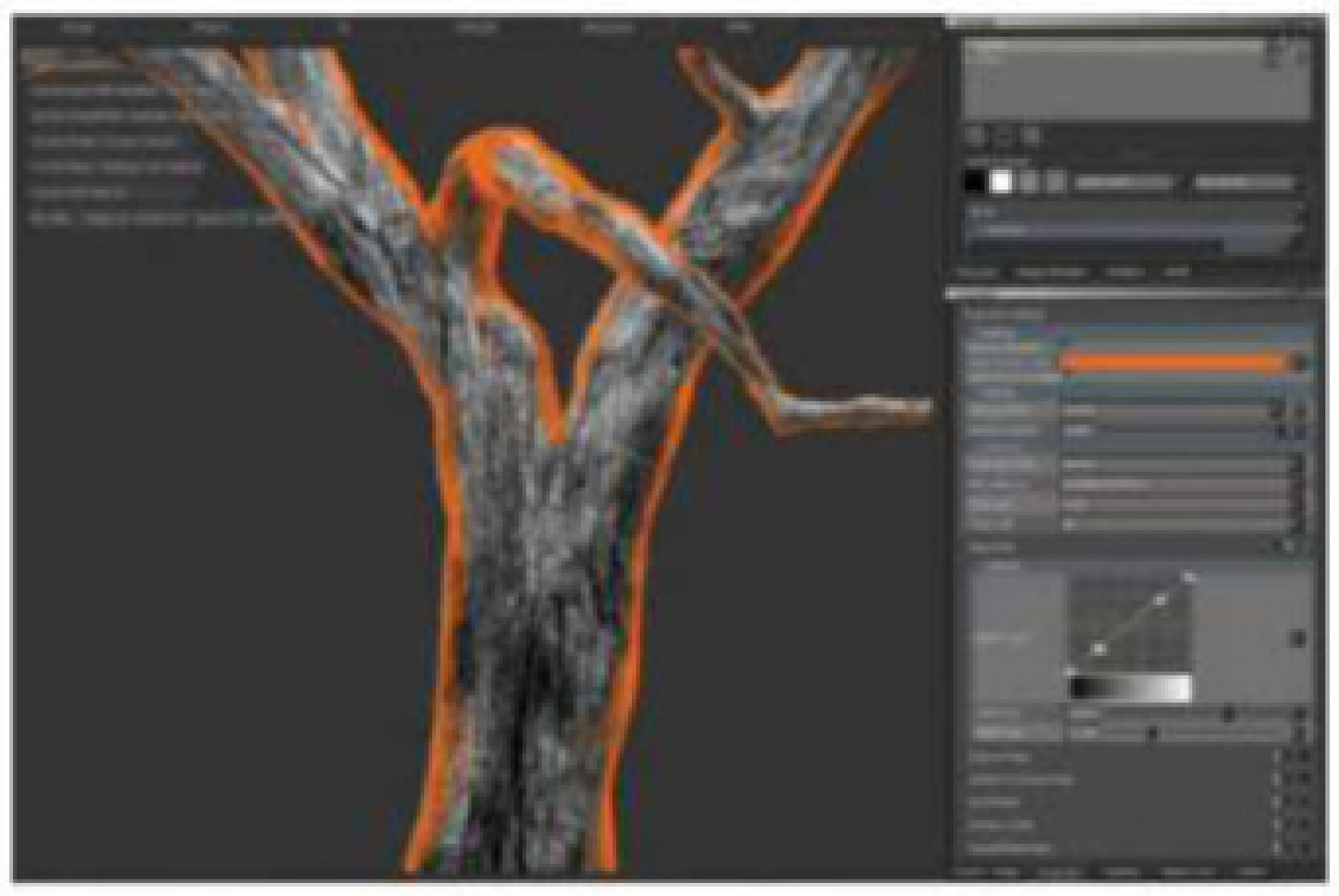
One of the bigger strengths of doing the post-production of your image in NUKE is that you can do your corrections on a per-channel basis. In this image you can see I'm inside the properties of a Color Correction Node. I'm tweaking the Gamma of the Master and also the Saturation in the Shadow, Midtone and Highlight areas. Now, by pressing the button with the number 4 on it, I can do this per channel. That's an incredible amount of control!

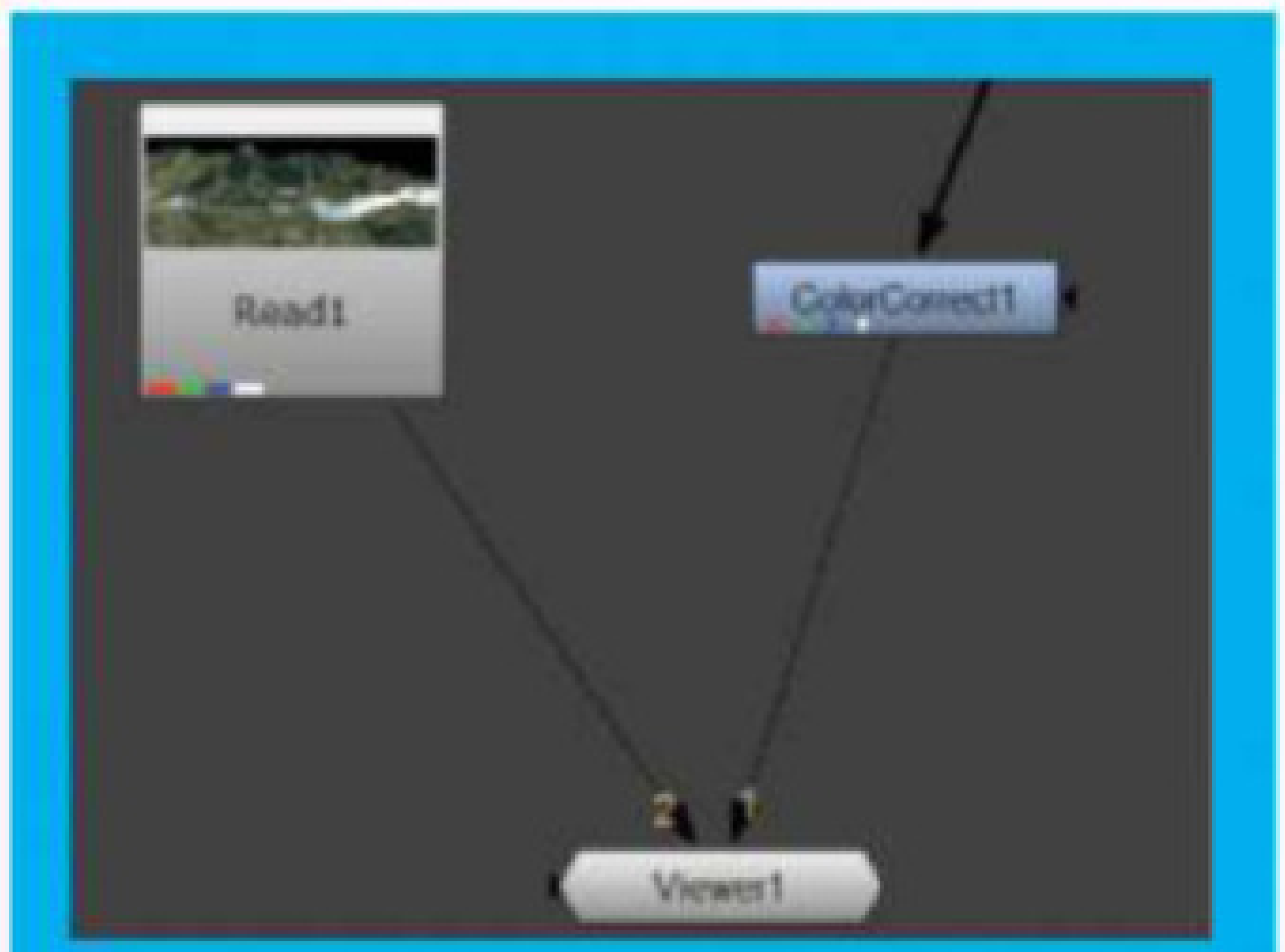


EDGE MASKING

A great feature in MARI is Edge Masking. It enables you to specify a zone on the edge of your model as a falloff, so the paint or images you apply don't get smeared on the edges. You can choose the Mask Preview colour so it contrasts nicely. The Falloff Start and End can be tweaked to your liking and you can even draw your own Falloff curve.

For even greater control, combine Edge Masking with Ambient Occlusion Masking, Depth Masking or Fractal Noise Masking.





QUICK COMPARISONS

An easy way to speed up your NUKE workflow is to set up a quick way to compare your render before and after your corrections. Just plug in two connections to your Viewer; one to the Read node of your original render and the other to your last Correction node. Now easily switch between them by pressing the 1 or 2 key.

CONCLUSION

The AMD FirePro™ W9000 chewed through everything I threw at it with ease. As an artist, it's a great feeling not having to worry about your hardware. I'll often worry whether my workstation can handle what I throw at it, or if it'll get too hot. However, thanks to the AMD FirePro™ technology here, I could completely focus on the artistic side of my work. For those artists looking to update their current system with a powerful and professional graphics solution, but are perhaps constrained by budget, check out the recently released AMD FirePro™ W8100 graphics card. It packs a massive punch in power with 8GB of dedicated memory and 4.2 Teraflops of single precision performance without the price tag of its bigger brother (W9100).

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